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transparent white, assumed by the whole of these plants, stem, scale-like leaves, and flowers, it is certain that the roots derive their nourishment from dead and rotten, not from living vegetables. Nor are these peculiarities of colour characteristic of any particular type of organization, for the species known belong in nearly equal numbers to three very different groups of plants, *Gentianeæ* amongst dicotyledons, and *Burmanniaceæ* and *Triurideæ* among monocotyledons, two at least of these families having genera, if not species, closely allied to them, with ordinary green leaves and stems. The physiological cause of their abnormal condition remains therefore still to be investigated.

Mr. Spruce's expedition has added much to our catalogue of these species. He found them particularly to abound in the forests of the Rio Uaupés, and other tributaries of the Rio Negro. They are there generally known to the Indians by the name of *Jurupari-eremana*, that is, "Devil's beard;" "but assuredly," adds Mr. Spruce, "the Devil is not so black as he is painted, if these pretty things resemble anything about his sable majesty." The specimens he has sent home are carefully collected and dried, and have afforded ample materials for completing the definition of the genera and species to which they belong; although, in some cases, the extreme tenuity of the flowers, and consequent difficulty of ascertaining the precise forms of their more delicate parts, leave a few points yet uncertain, which can scarcely be satisfactorily cleared up without the examination of the living plant.

Such of these species as belong to *Gentianeæ*, chiefly *Voyrias*, have already been described in the last volume of this Journal. I propose now to enumerate those which are comprised in the two above-mentioned monocotyledonous families.

THE TRIURIDÆ were first proposed as a distinct Natural Order by Mr. Miers, in the 19th volume of the Transactions of the Linnean Society of London. He afterwards, in a monographical paper in the 21st volume of the same work, entered into more details on their structure and affinities, giving at the same time descriptions of all the species known to him, illustrated by drawings executed with his usual neatness and accuracy. Two Javanese species have been since figured and described by Blume in his *Museum Botanicum Lugduno-Batavum*, and the Order will now probably maintain its ground as a substantive group, allied to *Alismaceæ* in its free apocarpous gynoecium and exalbuminous embryo, but differing chiefly in its perianth, always

uniserial, even when the number of its divisions is double that of the stamens, as well as in the apparently simple straight embryo.

The genera proposed by Miers are five, a number which subsequent discoveries would tend rather to reduce than to enlarge. The two first, *Triuris* and *Hexuris*, each with a single species, have dioecious flowers, a terminal style, and the lobes of the perianth equal in number to that of the stamens, three in *Triuris*, six in *Hexuris*. The three others, *Soridium*, *Sciaphila*, and *Hyalisma*, closely resemble each other in habit, and are well distinguished from the two former by their monoecious flowers (the upper ones male, the lower female), their lateral, almost basal styles, and the lobes of the perianth twice the number of the stamens. In *Sciaphila*, the principal genus, now consisting of four Asiatic* and four American species, the perianth has six divisions, with generally, if not always, three stamens.† The Brazilian *Soridium*, and the Cingalese *Hyalisma*, each consisting of a single species, differ from *Sciaphila* solely in these numbers being reduced to four and two in *Soridium*, and increased to eight and four in *Hyalisma*. But as one of the new species of *Sciaphila*, described below, bears occasionally tetramerous male flowers, precisely like those of *Soridium*, it may be a doubt whether the three genera ought not to be re-united into one, under Blume's original name of *Sciaphila*.

Mr. Spruce gathered a variety of *Triuris hyalina*, Miers, with smaller

* These Asiatic species are:—

1. *S. nana*, Bl.; racemo paucifloro, perianthii segmentis lanceolatis imberbibus, stylo ovario pluries longiore.—From Java, and apparently the same species, gathered in Khasia by Drs. Hooker and Thomson.

2. *S. tenella*, Bl.; racemo multifloro, perianthii segmentis lanceolatis apice intus barbatis, stylo clavato-penicillato ovarium vix superante.—From Java and from the Philippines, if, as there is every reason to believe, the *S. maculata*, Miers, and *S. consimilis*, Bl., are conspecific.

3. *S. erubescens*, Miers; racemo multifloro, perianthii segmentis lato-lanceolatis imberbibus, stylo clavato-penicillato ovarium vix superante.—From Ceylon.

4. *S. secundiflora*, Thwaites, MS.; racemo paucifloro, pedicellis secundis, perianthii segmentis longe subulato-acuminatis imberbibus, stylo clavato-penicillato ovarium vix superante.—From Ceylon (Thwaites). The flowers are considerably larger than in the three last species.

† Both Miers and Blume ascribe indeed to *Sciaphila* six stamens, but in all the specimens I have examined, both Asiatic and American, I find but three; and that is also the number represented in Dr. Hooker's beautiful dissections of the Khasia species, and mentioned by Dr. Thwaites in his manuscript descriptions taken from fresh Cingalese specimens. It appears that, in some instances at least, the two lobes of the anthers, which, before they open, appear to be disjoined, have been mistaken for two distinct anthers. In the old flowers the two cells become confluent at the apex.

flowers and shorter tails to the perianth, in the woods of the Rio Uaupés, and the *Soridium Spruceanum* in the woods of Caripi, near Pará, and again in those of the Uaupés, mixed with *Sciaphila albescens*. The same vicinity of the Rio Uaupés furnished him with the three following new *Sciaphila*, of which one only American species (*S. picta*, Miers, from New Granada) had been previously known:—

1. *Sciaphila albescens*, sp. n.; racemo elongato, pedicellis perianthio fœmineo imberbi 2–3-plo longioribus, stylo ovarium longe superante.

This very much resembles in appearance the *Soridium Spruceanum*, but is easily known by the length of the pedicels, besides the floral characters. It is a somewhat larger and stiffer plant than the *S. picta*, often attaining 6 inches, or rather more, and is altogether of a whitish colour. The scale-like leaves are narrow, tapering into a fine point; they are generally marked, as in other species, with oblong or linear coloured spots. The pedicels are from 2–3 lines long, stiff, and horizontally spreading or curved downwards. The flowers are about the size of those of the *Soridium*, but the female perianth has always six divisions, and the almost feathery styles, proceeding from near the base of the ovaries, are more than twice their length at the time of flowering. Of the three male flowers I examined, two had six divisions and three stamens, the third had four divisions and two stamens, precisely as in *Soridium*. The carpels in this and the other species open when ripe in two valves, exposing the dark brown, somewhat shining seeds.

2. *Sciaphila purpurea*, sp. n.; elata, racemo elongato multifloro, pedicellis perianthio fœmineo apice barbato 3–5-plo longioribus, stylo apice clavato-penicillato ovarium vix superante.

This is by far the largest species hitherto known, the tallest specimens found by Mr. Spruce having measured, when fresh, 4 feet 2 inches in length, although the generality of them are not much above a foot. The scale-like leaves are not so narrow as in *S. albescens*, the flowers rather larger, more numerous, on slender pedicels, half an inch or more in length. The divisions of the perianth, both male and female, are six, narrow lanceolate, each with a tuft of transparent hairs at the apex on the inside. The carpels are very numerous, the short styles proceeding from their base. The ripe carpels, not half the size of those of *S. albescens*, are four times as numerous, and form dense globular heads, about 3 lines in diameter. This species was generally found growing on Termites' nests, in trees.

3. *Sciaphila corymbosa*, sp. n.; racemo in corymbum contracto, perianthio imberbi, stylo clavato-penicillato ovarium vix superante.

This is a purplish species, about the size of *S. albescens*, or rather larger, and distinguished from all the genus by the inflorescence. The pedicels are all crowded at the summit of the stem, so as to form, before the flowers expand, a little head, which becomes a corymb as the pedicels lengthen. The scale-like leaves, and especially the bracts, are larger and broader than in all other species, those of the male flowers being 2 or 3 lines long and a line broad, almost to the apex. The flowers and carpels are of the size of those of *S. albescens*, but the styles are short, as in *S. purpurea*. The perianth, always six-cleft, is whitish outside, but purple inside, like the rest of the plant. In one young male bud there appeared within the anthers a fleshy mass resembling an inner series of three imperfect anthers, or perhaps more probably an abortive rudiment of carpels. Other flowers showed only the three usual anthers, without any central mass.

Of BURMANNIACÆ Mr. Spruce gathered eleven species, all of them coloured like the *Triurideæ* and *Voyriæ*, with their leaves reduced to similarly coloured scales, although two of them belong to the genus *Burmannia*, in which the generality of species, Asiatic as well as American, have the root-leaves at least more or less developed and green. Of these two leafless species, one is the common delicate *B. capitata*, whose wide geographical range extends from the southern states of North America, through the West Indies and Guiana, over nearly the whole of Brazil. Mr. Spruce found it in peaty soil, between tufts of long grass, on the Igarapé de Irurá, near Santarem. The other one is new, from the sandy woods along the Rio Uaupés, with the following characters:—

Burmannia tenella, sp. n.; filiformis, foliis squamæformibus minutis linearibus appressis, floribus solitariis vel in cyma bifida paucis disitis, perianthii angulis alatis.—*Herba* semipedalis, caule simplici v. rarius diviso. *Squamæ* paucæ in parte inferiore omnes appressæ, vix lineam longæ. *Flores* albidæ, laciniis apicalibus luteis, magnitudine *B. bifloræ*, nunc solitarii, nunc terni lateralibus longe pedicellatis, nunc rarius pluries secus ramos cymæ bifidæ subsessiles, remoti; alæ oblongæ, angulo exteriori acuto-adscedente. *Antherarum* connectivum apice cornubus duo brevibus basi membranula obovata appendiculatum. *Capsula* trilocularis et semina omnino *Burmanniæ*.

The remaining species all belong to the tribe of *Dictyostegæ*, established by Miers in the 18th volume of the Transactions of the Linnean Society, and distinguished from the true *Burmannias* by the parietal placentation, showing however in all other respects too great an affinity to that genus to be separated otherwise than as a distinct tribe of the same Natural Order. Two of Mr. Spruce's are included in Mr. Miers' monograph; the other seven constitute a new and very curious genus, which, notwithstanding the abundance of specimens in the district visited by Mr. Spruce, appears to have escaped the notice of most other collectors, as I can neither find any record of it in any published work, nor any specimens in our herbaria, excepting two or three of one of the species described below, mixed with a *Dictyostega*, among Purdie's New Granada plants.

The following are the *Dictyostegæ* of Mr. Spruce's collection:—

1. *Apteria setacea*, Nutt.—*A. lilacina*, Miers, in Linn. Trans. vol. xviii. p. 546.—*A. hymenanthera*, Miq. Stirp. Surin. p. 216.

I can perceive no difference in the specimens from North America, from Mexico, Jamaica, Surinam, New Granada, and various parts of Brazil, except in the size of the plant, and especially of the flowers, but that varies in different specimens from the same localities. The anthers appear to me to be the same in all that I have examined, although differently described and figured by different writers; which may be owing to the different stages of growth in which they may have been examined, as well as to the great nicety required in ascertaining the exact forms of these exceedingly delicate flowers from dried specimens. Mr. Spruce's were gathered on inundated sandy islands, among roots of trees at the falls of San Gabriel, on the Rio Negro, and again in a similar situation near Panurú, on the Uaupés. They have mostly large flowers, from 6 to 8 or even 9 lines in length, especially those from San Gabriel. In the Uaupés specimens the flowers are generally rather under 6 lines.

2. *Dictyostega Schomburgkiana*, Miers, var. *parviflora*.

On tree-roots in the shady woods of the Uaupés. I can find no other difference between these and Schomburgk's specimens, than the small size of the flowers, and more slender growth. The shape of the flowers is indeed the same in both as in the common *D. orobanchioides*, of which it may ultimately prove to be a mere variety; and even the *D. umbellata*, Miers, may be no more than the same plant in a very young state. The *D. costata*, Miers, is unknown to me. The tropical African

D. longistyla, though still nearly allied to the Brazilian ones, is more decidedly distinct, and in the Hookerian herbarium are a number of specimens gathered by Purdie in the woods of Maracaybo, in New Granada, which, besides their remarkably large and rigid stature, show a decided character in the long tubular shape of the perianth. In giving it the collector's name, with the subjoined diagnoses,* I do not however pretend to decide on the relative value of these characters to those by which Mr. Miers distinguished his species, as it requires a more complete acquaintance with all these forms in different stages of growth, and under different circumstances, to judge which of them are specifically distinct, or whether they should all be considered as more or less permanent varieties of one species.

PTYCHOMERIA, genus novum *Burmanniacearum* e tribu *Dictyostegearum*.

—Char. gen. *Perianthium* infundibulare, tubo longo sub apice demum circumscisso, limbi decidui laciniae 3 exteriores latae patentes subtrilobae, lobis lateralibus alaeformibus ante anthesin inflexis, 3 interiores parvae vel nullae. *Stamina* versus apicem tubi 3, cum limbo decidua, filamentis brevissimis, antheris bilocularibus, loculis distinctis, connectivo subdilatato inappendiculato. *Ovarium* in fundo perianthii adnatum uniloculare, placentis parietalibus multiovulatis. *Stylus* apice trilobus, lobis incrassato-dilatatis supra nonnunquam bicornutis v. biaristatis. *Capsula* subglobosa, perianthii tubi parte persistente coronata, apice ad maturitatem irregulariter rupta. *Semina* angulato-globosa, verrucosa, embryo exalbuminoso.—*Herbæ* annuæ inter folia emortua in sylvis Brasiliæ crescentes, coloratæ v. hyalinæ. *Folia* et bracteæ squamæformia, cauli concolora. *Inflorescentia* *Burmannie*; cyma nempe terminalis bifida, pedicellis secus ramos simplices erectis recurvisve brevibus unifloris, nunc in capitulum contracta bracteis sæpe conspicuis imbricatis, nunc laxa squamis bractealibus minutis v. omnino inconspicuis.

§ 1. DIPLOMERIA.—*Laciniae perianthii interiores 3 parvæ denticuliformes. Bracteæ sæpius squamis caulinis submajores.*

1. *P. fimbriata*; humilis, rigida, squamis ovatis lanceolatisve, cyma subcapitata, floribus sessilibus bracteisque orbiculatis imbricatis, perianthii laciniarum exteriorum lobo medio fimbriato.—*Herba* 3–4-pol-

* *D. Purdieana*, sp. n.; rigida, elatior, perianthii parte libera ovario plus duplo longiore.—*Habitus* et inflorescentia *D. orobanchioidis*. *Caulis* 1–1½-pedalis. *Perianthium* 3 lin. longum, lacinii interioribus parvis. Cætera *D. orobanchioidis*.—In sylvis humidis montium provinciæ Maracaybo Novæ Granatæ (*Purdie*).

licaris, albescens. *Squamæ* circa 2 lin. longæ, concavæ, latitudine variabiles. *Cyma* primum globoso-capitata, demum lateraliter excrecens, pollicem lata. *Bractee* amplæ, perianthii tubum æquantes, cum floribus arcte imbricatæ. *Perianthium* circa 4 lin. longum, post limbum delapsum 2 lin., basi leviter 3-costatum; laciniarum exteriorum lobus medius latus, apice incrassatus et dorso appendiculis linearibus fimbriatus, laterales membranacei; laciniæ interiores in sinubus parvæ, latæ, crassiusculæ. *Antherarum* loculi discreti obovoidei. *Styli* lobi dilatati, inappendiculati. *Placentæ* 3, ovulis numerosissimis. *Semina* tamen pauca (sæpius duo tantum versus apicem cujusve placentæ) maturescunt.

In the caatingas along the Uaupés, near Panuré, and a single specimen near San Gabriel.

2. *P. capitata*; humilis, rigidula, squamis angustis, cyma globoso-capitata, floribus sessilibus bracteisque lato-ovatis acutis imbricatis, perianthii laciniarum exteriorum lobo medio nudo.—*Herba* albescens, habitu *P. fimbriatæ* affinis, sed paullo altior et tenerior, squamis angustioribus. *Florum* capitulum non dilatatum. *Bractee* ovato-lanceolatæ v. fere orbiculatæ, apice acutæ, perianthio fere æquales; hujus laciniarum exteriorum lobus medius crassiusculus est sed non appendiculatus; laciniæ interiores parvæ, ovatæ.

Amongst dead leaves in woods on the Uaupés, near Panuré.

3. *P. cymosa*; rigidula, squamis ovatis, cyma divaricata, bracteis ovatis oblongisve pedicello brevioribus, perianthii imberbis laciniis intimis minutis, styli lobis longe et tenuissime biaristatis.—*Herba* semipedalis v. paullo altior, in vivo tota violacea, siccitate flavicans, simplex v. subramosa. *Squamæ* concavæ, 1–1½ lin. longæ. *Cyma* terminalis, primum subcapitata, ramis demum divaricatis usque ad 1–1½ poll. excrecentibus; adsunt etiam sæpe cymæ minores ad apices ramulorum ad axillas squamarum caulis nascentium. *Bractee* lato-ovatae, 1–1½ lin. longæ, hyalinæ. *Pedicelli* erecti, 2 lin. longi. *Flores* aperti 5 lin. longi, post limbum delapsum vix ultra 2 lin. *Perianthium* extus violaceum, intus album; laciniæ exteriores latæ, lobo medio integro lateralibus vix angustioribus alaeformibus tenuibus obliquis denticulatis; interiores minimæ, dentiformes, vix conspicuæ. *Styli* lobi incrassato-dilatati, supra aristis 2 setæformibus ultra lineam longis appendiculati. *Capsula* subglobosa, 1¼ lin. diametro, leviter 3-costata. *Semina* subglobosa.

In woods on the Rio Uaupés (Spruce) and, apparently the same species, in moist woods of the mountains of Maracaybo with *Dictyostegia Purdieana* (Purdie).

§ 2. APLOMERIA.—*Lacinia perianthii interiores omnino deficientes.*
Inflorescentia laxa, bracteis minutis vel nullis.

4. *P. divaricata*; filiformis, squamis minutis, cymæ bifidæ ramis divaricatis plurifloris, bracteis minimis clavato-peltatis, styli lobis apice brevissime bicornibus.—*Herba* albescens, semipedalis v. interdum fere pedalis, simplex v. subramosa. *Flores* albi, extus punctis violaceis colorati, secus ramos 1–3-pollicares horizontales cymæ gracilis regulariter dissiti, erecti. *Pedicelli* ovario vix longiores. *Bractea* minimæ, crassiusculæ, substipitatæ, nigre. *Perianthium* et stamina *P. cornutæ*. *Styli* rami apice pariter appendiculati, sed cornua latitudinem lorum non excedunt.

This species, remarkable for the wide-spreading slender branches of the cyme, as well as for the peculiar bracts, is the most common on the Uaupés, growing everywhere throughout the forest, though in a very scattered manner. The flowers emit a very pleasant odour, not unlike that of our Primrose.

5. *P. cornuta*; filiformis, squamis minutis, cyma laxa pauciflora, pedicellis elongatis, bracteis minimis angustis, styli lobis apice longe bicornibus.—*Herba* tenella, pallida v. subpurpurascens, 3–6-pollicaris. *Flores* albi, in cynam laxam terminalem 3–7-floram dispositi, addito interdum ramulo axillari uno alterove 3–5-floro. *Pedicelli* ovario 2–3-plo longiores. *Perianthii* tubus gracilis, 3 lin. longus, limbi lacinie latæ tenerrimæ lobis lateralibus post explicationem vix ab intermedio distinctis. *Antheræ* in summo tubo subsessiles, loculis disjunctis, connectivo tenui. *Styli* lobi incrassato-dilatati, cornubus subulatis circa lineam longis e fauce perianthii exsertis. *Capsula* ovoidea, seminibus e quaque placenta plurimis subglobosis.

In the woods of the Uaupés.

6. *P. mutica*; filiformis, squamis minutis, cyma laxa pauciflora, pedicellis elongatis, bracteis parvis ovatis, styli lobis inappendiculatis.—*Varietates* adsunt duæ, colore distinctæ, in altera atropurpureo, in altero cinnabarinio. *Perianthium* intus albescit.

With the *P. cornuta*, from which it scarcely differs except in colour and the want of the appendages to the lobes of the style.

7. *P. tenella*; filiformis, squamis minutis, cyma pauciflora, floribus subsessilibus, bracteis minimis nullisve, styli lobis inappendiculatis. — *Herba* albescens, 3–6-pollicaris. *Cymæ* irregulares, interdum ad spicam simplicem interruptam 2–6-floram reductæ. *Flores* fere 4 lin. longi, v. in var. β minores, tenerrimi.

In the woods of the Rio Negro, near Barra, and the small-flowered variety in the Serra da Gama on the Rio Negro, and in the gapó of the Rio Uaupés.

Extract of a Letter from MR. LOUIS KRALIK, dated Sfax, June 4, 1854.*

I passed three months at Gabès. This appears a very long time, and yet it was hardly sufficient to collect all the plants to be found in the neighbourhood. As the circle of my excursions was extended I daily added some new species to my stock. My intention was to have quitted the district of Gabès for a fortnight or three weeks, and to have consecrated that time to a visit to Djerba (the ancient Lotophagitis), and the opposite coast of Zerziz; but man disposes and circumstances unlooked for often thwart his designs. This has been the case in regard to my projects. I had passed the greater part of the three months at Gabès alone; on the return from Sfax of Mr. Henry Mattei, the French Consular agent, a new and vast exploration presented itself, and the expedition projected to the Lotophagitis was adjourned. The time of sheep-shearing amongst the Arabs had arrived; Mr. Mattei's affairs obliged him to make a journey in the territory of the Beni-Zid, whose wool he had just contracted for, and I accepted eagerly the offer he made me to accompany him. The Beni-Zid, who, as I told you in my former letter, are continually at war with the Hamema, were then encamped at about five leagues from Gabès, towards the west, beyond the chain of mountains called the Djebel Keroua in Mr. Pelissier's map. Although this chain is only of moderate height, at most 2000 feet, and the mountain-pass through which we went could scarcely have exceeded a quarter of this altitude, the entire vegetation however changed *à coup d'œil*. Instead of the eternal Helianthemums, *Echiochilon fruticosum*, *Linaria Aegyptiaca*, *Erodium glaucophyllum*, *Anthyllis tragacanthoides*, etc., which, with sad uniformity, cover the whole plain of the desert which extends between the palm-wood of Gabès and the moun-

* On a botanical tour in the Regency of Tunis.

tain; *Erucaria Aleppica* appeared, and another species, the upper articulation of whose fruit terminates in a long curved beak, and which, if I remember right, has lately received botanical baptism at the hands of our friend Cosson, *Neurada procumbens*, a *Calycotome*, a very variable annual *Chrysanthemum*, a shrubby *Teucrium* with small white flowers arranged in a spike, a *Carduncellus*, the *Gymnarrhena micrantha*, the *Sonchus quercifolius*, a *Reseda*. These two last were inseparable companions: wherever the one grew the other was sure to be found, the *Sonchus* particularly in such abundance that it was evident that this was its native station; for though, on account of the easy dissemination of its seeds by the wind, it is found here and there in the plain almost as far as the palm-woods, and particularly in the Wadis which descend from the hills in these stations, it is always isolated; but not so on the hills, where it is evidently at home. The two companions (the *Reseda* and the *Sonchus*) encircle the mountain at about half its height, and are wanting at its base and on the plateau which surmounts it. As to the *Reseda*, I have great difficulty in giving you an idea as to what it resembles or what it is unlike. Its external characters are:—root annual; stalk stiff, straight, and *virgated*, as in *R. alba*, but far more slim; the flowers spiked, but smaller; the lower leaves entire, cordiform, the upper with linear divisions; the whole plant, leaves and stalk, of a deep red.*

I am thus well recompensed for my desertion of the antique Loto-phagitis. I very much doubt whether it would have added a single species to those I had met with on the continent, but I hope still to visit it. I had become, however, the guest of the Beni-Zid: I had eaten their cooscoosoo, and slept beneath their tents. Though no doctor, I had prescribed ptisanes, and in entire security I could wander alone wherever I wished throughout their territory. It was rumoured throughout the douars that an Aboa Hashish had arrived, and I was everywhere well received as the guest of the tribe.

As to my existence under the tent of the Arabs, I will not attempt to describe it. Our ancestors said "*sale comme un Juif*:" this was the utmost of their knowledge, for they had never seen an Arab. After a repose in an Arab tent, long ablutions in the Oued Gabès and a complete change were a *sine quâ non*; even then certain intruders cling to the skin.

* This plant is very local: on subsequent visits to the mountain I never found it. It seems to be confined to the zone I mentioned.

I made my excursion amongst the Beni-Zid on the 27th and 28th of April. On the 1st of May I again visited the mountain, but was obliged to return sooner than I intended, having missed the donkey which carried my paper and provisions. Nevertheless I hit upon a most curious locality, in which to my great surprise I found numerous species of the lower mountains of the Mediterranean basin: *Sideritis Romana*, *Campanula Erinus*, *Anthyllis tetraphylla*, *Psoralea bituminosa*, etc. etc. These plants do not reach the plain of Gabès; they are found in a large Wadi, which I explored more in detail on the 4th and the 18th of May. This Wadi presented a most singular mixture of Provençal and African species. On the 4th I followed up the Wadi to the highest point of the Djebel Keroua, which is called Zembla la Duaria. This point gave a *Helichrysum* quite unknown to me, very different from any of the Mediterranean species, a *Periploca*, a *Sonchus*, and the *Lacellia Libyca*, Viv. Viviani compares the *habitus* of this species to *Centaurea Cyanus*, whereas it resembles much more *Amberboa Lippii*. On the 14th of May I found the *Lacellia* in the plain which extends from the Djebel Aziza in the north to the mountains of Matmata in the south. The plant of the mountain, though identical with that of the plain, is smaller. I next found a *Scabiosa* which Balansa has already collected, *Origanum Creticum*?, two new localities for *Gymnarrhena*, a *Brassica siliquis pendulinis*, an *Erythraea* on the very summit of the mountain amongst blocks of stone, two *Hippocrepides* which I have never found in the plain, one of them probably merely *H. multisiliquosa*, two *Antirrhinums*, a single little specimen of a *Specularia*, and a single specimen of *Callipeltis cucullaria*, of which I likewise found only a single specimen in the Wadi at the foot of the Djebel Aziza; an *Erodium*, like *glaucophyllum*, but perfectly distinct in its calyx and fruit; an immense quantity of a little slender *Linaria* with a tortuous stem; an *Umbilicus*, etc. etc. This excursion gave me, too, the only *Capsella Bursa-pastoris* I have yet seen.

On the 12th I made another excursion, accompanied this time by Mr. Mattei, amongst some other douars of the Beni-Zid; encamped about twelve leagues to the south-west of Gabès, in a vast plain six or seven leagues square, bounded on the north by the Djebel Aziza, on the west by the Djebel Melâb, which is not marked on Mr. Pelissier's map, and on the south by the mountains of Matmata. I passed here the 13th and 14th of May. My visit to the Djebel Aziza, which took

place on the 13th, added but little to my collections, though it is higher than the Zembla la Duaria; but it gave me new localities for some interesting species, the *Gymnarrhena* amongst others. To reach it I had three long leagues to go through the plain, the whole of which had been ravaged and devoured by the sheep, but in the middle a large space had been sown with barley not yet cut, and from which the flocks had been kept carefully at a distance. On the 14th I made the tour of this plot, which doubtless gave me a very fair idea of the vegetation of the whole plain. I found in abundance a *Reseda* nearly allied to *Phyteuma*, if not *Phyteuma* itself, which I had formerly found, but only in single specimens, in the desert about Gabès; and several other curious plants, an *Echinospermum*, a *Delphinium*, and in great abundance a *Euphorbia*, of which I had only gathered one or two specimens in Egypt, and which M. Durieu found, but very sparingly, in Algeria.

On my return to the tent of our sheikh, I found him playing at draughts with the sheikh of a neighbouring douar. The board was a square of sand, heaped up from the bottom of the tent; and what do you imagine were the draughts?—one played with pieces of camel's dung, and the other with sheep's dung! This will give you an idea of Arab cleanliness.

But to return to our plants. From the above you will fully agree that I was right in profiting of the patronage of the Consul to obtain the *droit de bourgeoisie* in one of the most important tribes of these regions. I much regret that the kind solicitude of the Consul-general prevented me from entering the desert before. A splendid exploration that I should have made has been curtailed, for now that I have haunted the Arab tents, I have the fullest conviction that I could have accomplished it. Certainly quarrels existed between powerful and neighbouring tribes, wars even and razzias; marauders, it is true, have taken advantage of this state of affairs to rob and pillage. Notwithstanding all this, I am now persuaded, unfortunately too late, that a journey into the interior was realizable. I am convinced that my isolation itself would have been a cause of safety, and my occupation would have caused me to be respected as a physician; and after all, the worst that could have happened to me would have been that I might perhaps have been robbed. But it is useless now to argue the matter, as the time is gone by. After all, to explore properly the whole region from Gafsa to Tozzer and Nefzaoua would require an entire season.

I am here at Sfax against my will. I had embarked everything for Djerba, but the wind continuing obstinately against us, I persuaded the captain of the vessel I had freighted, for a slight addition to the price to change his course, and make sail for Sfax; but at midnight the wind deserted us, and the tide going down, left us high and dry a quarter of a league from the sea. We floated again with the tide, but, the north wind being against us, I and my companions determined to continue our route on foot; and after sleeping one night in the open air, and two in the Arab huts, we reached Sfax on the third day, but the boat did not arrive till seven days afterwards.

From Sfax I send you forty large packets of plants, in five bales covered with matting, as neither boxes, nor wood to make them, are to be had here. On the 7th of June I shall sail for Djerba, and if the wind is fair, I shall reach it on the following day. The greater part of the vegetation will, I know, be over; I shall therefore merely walk through the island, and, embarking on the south side, at Bordj-el-Kantara, visit Zerziz. This expedition will, I hope, be accomplished in fifteen or twenty days. I shall economize my time to the utmost, in order to give as much as possible to the Djebel Zaghuan.

The *Silene* I mentioned in my last is the *S. setacea* figured by Viviani. Another plant of Viviani which I have met with is his *Vicia intermedia*; but his figure and description are both so incomplete, that I doubt whether he ever saw the entire plant, as he says nothing of its underground portion, in which the fructification—*hypogæa*, as in the *Vicia amphicarpa*—is magnificently developed. The plant is as strong and as fully developed underground as above. Since I sent off my collections, I have already seven more large packets ready, and this plant will be found in the forty-second.

The weather has been very mild as yet, and my health is excellent. We have had but one day of scirocco; the rest of the time the wind has been in the north, with the exception of three or four days each month of east wind, which here brings with it rain.

The late Professor C. G. C. REINWARDT, and his LIBRARY.

[We make the following extract from a letter lately communicated to us from Holland.]

Dr. and Professor Reinwardt was, from his youth, destined to the

practice of medicine, and he applied himself with zeal to those sciences which form the basis of the art of healing; but his reputation for learning being established before he could commence this career, he was called to the Chair of Natural History at the University of Harderwijk, and, at a later period, to that of the Athenæum of Amsterdam. From this time may be dated his almost exclusive devotion to the study of botany, geology, and chemistry, without, however, losing sight of the rapid progress which the other natural sciences were making.

In 1815 he was appointed by the Government to accompany the commissioners who were to retake possession of the Dutch East Indies, ceded to it by treaty with the English Government. To render his talents useful to the Colonial Government of his country, by improving all that relates to the nature of the soil of Java, to agriculture, to sanatory regulations, to education, etc. etc., was the task imposed on Mr. Reinwardt.

Not satisfied with acquitting himself of these laborious duties, he travelled in all directions over Java, the Moluccas, seconded by the Government in all that he judged necessary to aid his botanical, geological, and zoological researches, and to form the numerous collection of the natural history and antiquities of India with which the museums of the University at Leyden are enriched.

Although his stay in India contributed much to enlarge the horizon of his scientific ideas, and enabled him to discover new relations between the different sciences which he cultivated, we must, however, regret that the encyclopædic tendency of his mind did not permit him to fathom the details, and by that means to increase the number of his discoveries. He embraced too much at once; and that explains how he could have attained the age of eighty years without having finished the description of his travels, which alone could give an exact idea of his knowledge and of the activity he displayed in the exercise of his numerous functions.

On his return to the Netherlands, Mr. Reinwardt was called to the chair of Natural History and Chemistry at the University of Leyden. After that period he completed his extensive library, to which he devoted much care and perhaps too much time. His constitution having suffered from tropical climates and from the fatigues of his travels, he experienced difficulty in walking; and although the handling of large folio volumes cost him much labour, the amiable man even in

age rarely permitted himself to be assisted. He maintained an active correspondence with many publishers, and collated the precious works, which came to him in sheets, himself. The least defect in a page of the text or in a plate, never escaped his attention. Subscriber to a large number of journals, he attached great importance to their completion. In a word, no work was ever placed on the shelves of his library but clothed in a binding of good taste.

It is with regret that we see the dispersion of so handsome a collection, which has been the object of so much solicitude, and which is the reflection of so vast a knowledge. A catalogue is recently published, which is not only complete, but very extensive; it contains the books which treat of the various studies of him who collected them; and those studies embraced the whole range of natural science. In his choice of books, Mr. Reinwardt did not allow himself to be guided by the considerations of a mere book-collector, but by the desire to assemble all that appeared remarkable in the branches of science which he cultivated; and to obtain his object he spared neither pains nor expense. The sale of this collection, it is expected, will take place in the month of March, 1855.—*J. G.*

BOTANICAL INFORMATION.

PLANTAIN FIBRE.

[Our own country and our Colonies too are alike engaged in seeking for useful vegetable fibres, whether for textile articles or for the manufacture of paper, and we are almost daily receiving samples from various friends. Our impression is, that the fibre of the Plantain (*Musa Paradisiaca*) is that which will prove of the greatest commercial importance; but the great difficulty has been the want of good and economical machinery for preparing it. We have the pleasure of receiving from a correspondent in Antigua the following statement, which has also appeared in the 'Weekly Register,' a journal of that island, for Tuesday, October 24, 1854.—ED.]

"There is ample reason to believe that we may safely congratulate West Indians on the completion of a machine which promises to be of

the utmost importance to these Colonies, by which the fibre of the Plantain is cleaned and prepared in the most simple, cheap, and expeditious manner. Attempts to construct such a machine have for several years occupied the attention of some of the ablest mechanicians of Europe, and have caused a vast expenditure of time, labour, and money without success. Many expensive and ingenious machines have been made and patented; but all have failed when brought into full operation, owing partly to the peculiar nature of the substance to be acted upon, and partly to ignorance respecting its nature and qualities. All the inventors acted on the principle of crushing the stem of the plant, and combing out the substance, filling up the interstices between the fibres, thus freeing them from native impurities. This appears to have been a false principle, and is the chief, if not the only, reason of all the failures that have resulted. But the failure of one party only stimulated others to greater exertion of mind, and greater diligence in developing their plans. The valuable qualities of the Plantain fibre for the manufacture of many descriptions of textile fabrics, for which flax, hemp, and even silk, are now used, as well as cordage and paper, held out the prospect of a rich reward to the successful inventor of a suitable machine for its preparation; and therefore it was that so many engaged in experiments which they deemed likely to realize their hopes of success. But the honour, the gratification, and, we hope we may add, the profit, that have hitherto eluded the grasp of so many ardent and anxious experimenters, seem to have fallen to the Honourable Francis Burke,* the Puisne Justice of Montserrat. This gentleman has been for several years experimenting in various ways on the Plantain stem, and trying to procure the fibre in a suitable state for manufacture; and it gives us great satisfaction to say he appears to have at last succeeded, even beyond his most sanguine hopes.

“He has completed a small machine which perfectly cleans the fibre, and leaves a beautiful white silky substance, resembling flax, only that it is about three times the length of flax, capable of being manufactured into any description of textile fabric, from the finest cambric to the coarsest sail-cloth. There are some specimens of the fibre now at this office for the examination of those interested in such matters.

“We have not seen the machine; but several gentlemen of this

* Now (December, 1854) arrived in England with his machine, and with a quantity of the Plantain-stems to show its action upon them.—*En.*

island have witnessed its operations, and they declare that its simplicity of action, the ease with which it can be worked, the impossibility of its going wrong and injuring the fibre, and its extreme cheapness, are surprising. A piece of the stem of the plant is held by one end in the hand, passed into the machine through the "feeder," and, being still held in the hand, is drawn out again perfectly clean and white. It can be worked either by the hand, by a mule, by water, wind, or steam power, according to its size. To work it requires no skill; a little boy or girl to "feed" it, is all that is requisite to ensure its satisfactory operation. The fibre cleaned in the course of the day is ready for shipment the same evening. A small machine to be worked by the hand, which will cost little more than three guineas, irrespective of any patent right, will, with the assistance of a little boy or girl to feed it, clean about 150 lbs. per day, and is so portable, being contained in a box about eighteen inches square, that it can be taken to the spot where the Plantains grow; they may be cut down, prepared, and the fibre carried home in the evening, ready for shipment. It can also be made on any scale—large enough to clean a ton a day if requisite. So small is the waste, that from 75 to 80 per cent. by weight of prepared fibre is procured from the plant, irrespective of its watery particles. And this waste substance is a valuable pulp, which requires only to be washed to fit it for manufacture into the finest writing-paper. The pulp alone, it is reckoned, will pay the cost of working, and the fibre will be net profit.

"Mr. Burke, whose indefatigable experiments and researches into the nature of West Indian fibres, and the best mode of preparing them for the manufacturers' use, seem to be now crowned with success, has determined, so soon as the accident from which he is now suffering (which we mentioned a couple of weeks since) permits, on going to England to procure a patent. He also intends to apply for patents in each of these Colonies. We learn that the machine will be exhibited and its operation shown at the Industrial Exhibition in this island (Antigua) next month.

"We omitted to state that the Dagger (the Aloe), and all the fibrous tribes of the West Indies, are as readily and as perfectly acted upon as the Plantain."

The BIG TREE (Wellingtonia gigantea, Lindl.).

Dr. C. F. Winslow, in 'The California Farmer,' a weekly journal published at San Francisco, has given an account of his excursion from "Murphy's Camp" (2400 feet of elevation), to the site of the "Big Tree," on the very stump of which he writes his letter (August 8, 1854), the spot itself being designated (at least by him) "Washington Mammoth Grove."

If this account is to be depended upon (and it must be confessed the learned Doctor's style is both flowery and hyperbolic), we learn some new and interesting particulars respecting this gigantic tree:—1, that the accounts brought home by our sober English traveller, Mr. William Lobb, do not give us the full height to which this Pine attains, by one-fourth; 2, that the locality seems to be circumscribed to an area of a few acres; and, 3, what concerns us more, now that Messrs. Veitch and Sons have enabled us to possess living plants, that the soil and atmosphere at the place of growth are singularly humid; and in this we think the Doctor is likely to be correct.

Omitting, then, his mention of "the sublime thoughts, such as have rarely before impressed his soul,"—"of such a nature that he often involuntarily surrendered himself to the idea that he was approaching the visible and actual presence of the Great One who revealed himself to Moses on the heights of Sinai," etc.,—we shall confine ourselves to the following extracts:—

"The road (from Murphy's Camp), gradually ascending for several miles over a varied landscape, becomes afterwards more level, or rather it undulates and winds for a long stretch among hills and valleys thickly wooded, and fit for farms and deer-parks. During the last three miles the ascent is steady and through a virgin wilderness of Pines, Firs, Spruce, Arbor-vitæ, and other cone-bearing trees, whose magnitude perceptibly increases with the altitude of the locality. The whole surface of the hill-sides is covered with herbage or plants, more or less verdant, and in spots there is a freshness to the verdure which reminds one of spring, and which contrasts strongly with the arid and dusty plains and hills of the lower sections of country. The wild raspberry, strawberry, pea, and hazelnut mingle their humble or more prominent foliage with the diversified undergrowths of the forests; and here and there new and attractive flowers struck my eye so pleasingly, that I was

compelled at times to stop, gather, examine, and admire them. The charm of these regions to the botanist would be in the freshness and luxuriance with which nature elaborates her vegetable forms. The vital principle, stimulated by the condensing vapours of the cool fresh air of night, and nourished by a suitable pabulum in the decomposing soil, acts with a steady energy, and thousands of stately trees stud the hills in all directions, so lofty as to amaze the observer, and to compel him when near them to strain his eyes to catch a view of their topmost offshoots. But the most amazing of all these vegetable productions are here; and nature, by peculiar geognostic arrangements, seems to have isolated them, to startle and arrest the attention of mankind, and to strengthen scientific truth touching the special distribution of organic races.

“So far as known, the vegetable growth to which the name of ‘Big Tree’ has been attached, grows in no other region of the Sierra Nevada, nor on any other mountain-range of the earth. *It exists here only*, and all the individuals of its kind, so far as I can learn, are localized to this vicinity. They are embraced within a range of two hundred acres, and are enclosed in a basin of coarse silicious material, surrounded by a sloping ridge of sienitic rock, which in some places projects above the soil. The basin is reeking with moisture, and in the lowest places the water is standing, and some of the largest trees dip their roots into the pools or water-runs. The trees of very large dimensions number considerably more than one hundred. Mr. Blake measured one ninety-four feet in circumference at the root; the side of which had been partly burnt by contact with another tree, the head of which had fallen against it. The latter can be measured four hundred and fifty feet from its head to its root (!). A large portion of this fallen monster is still to be seen and examined; and by the measurement of Mr. Lapham, the proprietor of the place, it is said to be ten feet in diameter at three hundred and fifty feet from its upturned root (!). In falling it had prostrated another large tree in its course, and pressed out the earth beneath itself so as to be imbedded a number of feet into the ground. Its diameter across its root is forty feet. A man is nothing in comparison of dimensions, while walking on it or standing near its side. This to me was the greatest wonder of the forest. The tree which it prostrated in falling has been burnt hollow, and is so large, a gentleman who accompanied us from Murphy’s informed us, that, when he first visited the

place two years ago, he rode through it on horseback for two hundred feet without stooping but at one spot as he entered at the root. We all walked many scores of feet through it, but a large piece of its side has fallen in near the head. But there are many standing whose magnitude absolutely oppresses the mind with awe. In one place, three of these gigantic objects grow side by side, as if planted with special reference to their present appearance. Another, so monstrous as to absolutely compel you to walk around it, and even linger, is divided at from fifty to a hundred feet from the ground into three of these straight mammoth trunks, towering over three hundred feet into the sky. There are others whose proportions are as delicate, symmetrical, clean and straight as small Spruces, that rise three hundred and fifty feet from the ground. In one spot a huge knot of some ancient prostrate giant is visible above the soil, where it fell ages ago, and the earth has accumulated so as nearly to obliterate all traces of its former existence. The wood of this tree, I am told by Mr. Lapham, is remarkable for its slow decay. When first cut down, its fibre is white, but it soon becomes reddish, and long exposure makes it as dark as mahogany; it is soft, and resembles in some respects Pine and Cedar. Its bark, however, is much unlike these trees; nearest the ground it is prodigiously thick, fibrous, and when pressed on has a peculiar feeling of elasticity. In some places it is eighteen inches thick, and resembles a mass of cocoa-nut husks, thickly matted and pressed together, only the fibrous material is exceedingly fine, and altogether unlike the husk of the cocoa-nut. This bark is fissured irregularly with numerous indentations, which give it the appearance of great inequality and roughness. A hundred and fifty feet from the ground it is only about two inches thick on the living tree, which is now being stript of its bark for transportation from the country.

“An hotel is built near the ‘Big Tree,’ whose bark was stripped last year and exhibited in San Francisco; and an appendage of the house is built over it, so as to constitute a hall for cotillion parties. At the root it measures ninety-six feet in circumference, and a portion of its prostrate trunk is used for a bowling alley. To overthrow it, holes were bored through with a large auger, and after the trunk was mostly separated, attempts were made to wedge and upset it. But its immense size and weight prevented the success of this undertaking, and on the fourth day it fell by the force of a strong wind. In falling, it

convulsed the earth, and by its weight forced the soil from beneath it, so that it lies in a great trench, and mud and stones were driven near a hundred feet high, where they have left their marks on neighbouring trees."

The following paragraph bears very hard upon Dr. Lindley.

"The name that has been applied to this tree by Professor Lindley, an English botanist, is *Wellingtonia gigantea*. By him it is declared to be so much unlike other *Coniferae*, as not only to be a new species, but to require description as a new genus. Other botanists of eminence think differently. To this, however, he has seen fit to apply the name of an English hero, a step indicating as much personal arrogance or weakness as scientific indelicacy; for it must have been a prominent idea in the mind of that person that American Naturalists would regard with surprise and reluctance the application of a British name, however meritoriously honoured, when a name so worthy of immortal honour and renown as that of Washington would strike the mind of the world as far more suitable to the most gigantic and remarkable vegetable wonder indigenous to a country where his name is the most distinguished ornament. As he and his generation declared themselves independent of all English rule and political dictation, so American Naturalists must in this case express their respectful dissent from all British scientific 'stamp acts.' If the 'Big Tree' be a *Taxodium*, let it be called now and for ever *Taxodium Washingtonium*. If it should be properly ranked as a new genus, then let it be called to the end of time *Washingtonia Californica*. The generic name indicates unparalleled greatness and grandeur; its specific name, the only locality in the world where it is found. No names can be more appropriate; and if it be in accordance with the views of American botanists, I trust the scientific honour of our country may be vindicated from foreign indelicacy by boldly discarding the name now applied to it, and by affixing to it that of the immortal man whose memory we all love and honour, and teach our children to adore. Under any and all circumstances, however, whether of perpetuity or extinction, the name of Wellington should be discarded, and that of Washington attached to it, and transmitted to the schools of future ages."

Bourgeau's Plants of the Canary Islands.

Scarcely are M. Bourgeau's beautiful collections of dried plants made in Spain during the past year (1854) named and distributed, than this indefatigable naturalist has embarked (December 17th) upon another expedition to the Canary Islands, where we have no doubt he will explore localities that have been little, if at all, visited, and where he will make further additions to the Flora Canariensis; and he expects to gather about four hundred species, "les plus spéciales de ces îles." It is his intention, we have just heard, on the present occasion, to collect seeds and living as well as dried plants; and any persons desirous of receiving the one or the other may address themselves, during M. Bourgeau's absence, to M. Cosson, No. 12, Rue du Grand-Chantier, Paris.

M. Huet du Pavillon: Plants of Sicily.

M. Huet du Pavillon has already distinguished himself by his botanical travels in Armenia, and by his collections made especially in the country between Trebizond and Erzeroum. He has now the intention of exploring the Botany of Sicily during the spring and summer of the present year (1855). He hopes, by his familiarity with the Flora of Sicily, and by the indications that he will receive from M. Gussone, to reap a rich and interesting harvest of plants. As many of the plants of Sicily are of common occurrence in all the basin of the Mediterranean, it is M. Huet's intention to limit his collections mainly to those that are more peculiar or rare.

The conditions of subscription are 20 francs per century to those who shall, previous to his departure in February, 1855, have advanced a sum of 50 francs; and 25 francs per century to those who will not have subscribed at so early a period.

M. Huet du Pavillon's address is No. 266, Rue Verdaine, Geneva; and Messrs. Philip Walther and Co., 15, Angel Court, Throgmorton-street, London, are authorized to receive subscriptions, which may save much trouble to subscribers in this country.

Mr. Botteri's Mexican Plants.

Mr. Botteri, a Dalmatian Botanist, is now engaged, in part by the Horticultural Society of London, in collecting plants and seeds in Mexico. Dried specimens he is allowed to dispose of on his own account, and he writes from Orizaba that he is busily engaged with the numerous vegetable productions around him.

Mr. Samuel Stevens, 24, Bloomsbury-street, undertakes to receive subscribers' names, and to transmit the collections when they are received, "at the usual price:" we presume, £2 the hundred species.

Mr. Stevens has still in his possession good sets of Mr. Botteri's Dalmatian plants on sale, about 250 species in each set, at 25s. per hundred, and all carefully named.

MR. SPRUCE'S PLANTS of the AMAZON RIVER and its tributaries.

The collections which have lately arrived from Mr. Spruce, made chiefly during an interesting voyage up the Uaupés river, are particularly numerous and particularly interesting, and are now preparing for distribution by Mr. Bentham. They contain perhaps more of novelty than any of the preceding collections, and are in excellent condition.

NOTICES OF BOOKS.

STARK, ROBERT M.: *A Popular History of BRITISH MOSSES; comprising a general account of their Structure, Fructification, Arrangement, and general Distribution.* Royal 16mo, numerous coloured figures. London, 1854.

As "most of the generic and specific characters employed in this work" are, confessedly, "taken from the second volume of Sir W. J. Hooker's 'British Flora,'" and as there is, moreover, evidence of much in the plates being taken from those of Hooker and Taylor's 'Muscologia Britannica' (references to which seem to be carefully avoided by our author), it can scarcely be considered a fit subject for criticism from our own pen: but we must say we should have been better pleased if the author had introduced some of the many valuable improvements

and corrections which have been made by others in the long interval that has elapsed since the publication of the second edition of the 'Muscologia Britannica' (1827), and the Muscological portion of the 'British Flora' (1833). Sixteen new species indeed are—as it would appear, by an after-thought—placed together at the end of the arrangement, separated from their respective genera and sections,—more to the author's convenience than that of the student, we suspect.

ARCHER, THOMAS CROXEN: FIRST STEPS IN ECONOMIC BOTANY, *for the Use of Students; being an Abridgment of 'Popular Economic Botany.'* Royal 16mo, many plates. London, 1854.

This, as well as the volume mentioned under the preceding notice, is one of a "Popular Series of illustrated works on Natural History," publishing by Mr. Lovell Reeve, and which, if judiciously executed, cannot fail to promote the cause of science among the uninitiated in this country. Being executed by different authors, it is to be expected that they are not all uniform as to excellence. Our very favourable notice of the 'Popular Economic Botany' of Mr. Archer is recorded at p. 284 *et seq.* of the fifth volume of this Journal; and it is in the present work candidly stated that 'The First Steps,' etc., are, "with some trifling alterations, an abstract of the 'Popular Economic Botany';" a work, the author continues, "which has received the approbation of the heads of the 'Department of Science and Art' (Marlborough House School, we presume), at whose suggestion this abridgment has been undertaken, with a view of making the subject available, in the cheap form of a school-book, to pupils of all classes." We cannot but wish it all success; and we feel sure that such will be the result; for the "Department of Science and Art" does not stop here: it has also employed Mr. Archer in preparing a series of diagrams, representing some of the most important plants and products; and also cabinets of the materials themselves, for carrying out the more satisfactory plan of ocular demonstration; hoping by these aids to render the acquirement of a general knowledge of *Raw Produce* easy to the most youthful class of students.



W. R. de la R. lith.

Vincent. Boudin. fign.

FLORULA HONGKONGENSIS: an Enumeration of the Plants collected in the Island of Hongkong, by Major J. G. Champion, 95th Reg.; the determinations revised and the new species described by GEORGE BENTHAM, ESQ.

(Continued from vol. vi. p. 117.)

MONOCOTYLEDONES.

With the exception of *Orchideæ*, Major Champion collected but very few monocotyledonous, and scarcely any glumaceous plants, although they are undoubtedly numerous on the island. They are therefore here mentioned merely for the sake of completing the enumeration of Major Champion's collection, and must not be taken as exhibiting anything like the real proportion of the monocotyledonous to the dicotyledonous vegetation of Hongkong.

The only *AROIDÆ* in the herbarium are the *Arum* (*Typhonium*) *trilobatum*, Linn., and the *Polthos scandens*, Linn., both found growing in ravines, and both having a wide geographical range in East India and the Moluccas. A larger species of *Polthos* was seen diffusing itself on trees and rocks near the Buddhist temple, East Point. A large *Culadium* was observed growing in a ravine of Mount Parker, and Col. Eyre is said to have gathered three other *Aroideæ* not seen by Major Champion.

A species of wild *Phoenix*, and a *Pandanus*, are common near the sea-shore, the latter forming hedges and thickets.

The *ORCHIDÆE* are numerous. The original specimens have been deposited in the herbarium of Dr. Lindley, who has kindly determined them, and from whose and Major Champion's MSS. I extract the following enumeration:—

1. *Liparis longipes*, Lindl. Gen. et Sp. Orch. p. 30.—In clefts of rocks in the spring of the year. The species is common all over those parts of Asia which produce epiphytes.

2. *Liparis nervosa*, Lindl. l. c. p. 26.—In clefts of rocks, Victoria Peak. The flowers, appearing in November, are of a light isabella colour, varied with green, the column white. The rest of the plant is of a bright green.

3. *Liparis odorata*, Lindl. l. c. p. 26.—Very near the *L. nervosa*, but its column has an even, not an acutely toothed, margin, the sepals are

oblong and very fleshy, the flowers also appear to be whole-coloured and green. It is the same as a plant found in Chi-Kiang by Fortune.

4. There is another *Liparis* in the collection, but Major Champion has left no account of it, and Dr. Lindley felt unwilling to define it from a solitary specimen.

5. *Bolbophyllum radiatum*, Lindl. l. c. p. 55.—Abundant in a ravine on Victoria Peak. Flowers white. It is identical with the 'Tavoy plant.

6. *Pholidota Chinensis*, Lindl. Journ. Hort. Soc. ii. 308.—Abundant on rocks, Victoria Peak, and other places.

7. *Eria rosea*, Lindl. Bot. Reg. t. 978.—On rocks, Mr. Gough; flowering in January. It is also a Khasiya plant, it being undoubtedly the *Xiphosium acuminatum* of Griffith's Ic. t. 316.

8. *Conchidium Sinicum*, Lindl. sp. n.; foliis membranaceis scapo bifloro subæqualibus, labello serrato, bracteis acuminatis.

This curious little plant forms pale green tufts, which easily escape observation. It is distinguished from *Conchidium pusillum*, Griff., which is *Phreatia uniflora*, Wight, by its thin leaves, and very short two-flowered scapes; the lip is moreover very distinctly serrated. (*Lindl.*)

On bare rocks, on the top of Victoria Peak, flowering in November. It is cæspitose, with numerous aggregated pseudo-tubers. Leaves minute, oblong, apiculate, veinless except the midrib, 3-4 lines long, in pairs on each tuber. Scape filiform, about as long as the leaves, solitary on each tuber, bracteate at the top, and having two flowers nearly as large as the leaves, of a dirty yellowish-green, and slightly fetid. Sepals and petals nearly equal; the side sepals broader at the base, and cohering with the saccate spur. Column very short and rounded. Anther-case somewhat 3-lobed, imperfectly 4-celled. Pollen-masses 8, cohering by pairs into two sets. (*Champ.*)

9. *Cœlogyne fimbriata*, Lindl. Gen. et Sp. Orch. p. 41.—A pretty species, flowering abundantly in ravines about October. The sepals are lurid white, and the lip white, with the fimbriated portion puce-coloured. It has no perfume.

10. *Arundina Chinensis*, Blume.—Lindl. l. c. p. 125.—Common in Hongkong. Flowers in July.

11. *Phaius grandifolius*, Lour.—Lindl. l. c. p. 126.—This magnificent Orchid is common by the sides of streams. Flowering in April.

12. *Spathoglottis Fortuni*, Lindl. Bot. Reg. t. 19. 1845.—Common in Hongkong. Flowers in July.

13. *Apaturia Chinensis*, Lindl. Gen. et Sp. Orch. p. 131.—In marshy spots on the top of Mount Gough. Flowering in April.—The flowers are of a light lilac and canescently pubescent; the lip yellow.

14. *Ania latifolia*, Lindl. l. c. p. 130?—Major Champion states that this or an allied species grows on the island; but he has preserved no specimen.

15. *Cymbidium ensifolium*, Sw.—Lindl. l. c. p. 162.—On rocks near *Cypripedium purpuratum*, in October. The flowers are of a dirty white, with violet spots.

16. *Cottonia* (?) *Championi*, Lindl. sp. n.; racemis foliis distichis apice bidentatis mucrone interjecto brevioribus, labello ovato apice setaceo bipartito. (Lindl.)—*Herba* epiphyta, basi radicans. *Folia* alterna, disticha, coriacea, lineari-oblonga, basi inæquali-lobata, apice denticulato-bifida, apiculata. *Racemi* pauciflori, folio oppositi. *Flores* dilute lutei, columna pallide violacea. *Perigonii* ringentis foliola æqualia, oblonga, dorso carinata, interiora angustiora. *Labellum* semi-cymbiforme, breve, processu apiculatum apice furcato brachiis setaeformibus terminante, ecalcaratum. *Columna* brevis, dilatata, fornicata. *Anthera* bilocularis, erecta, bidentata; pollinia 4, caudicula lineari-subulata.

Mountains of Hongkong. On Victoria Peak, in April. (*Champ.*)

The labellum of this Orchideous plant (otherwise inconspicuous) is very remarkable, being semi-cymbiform, with a process at the extremity like a bowsprit, ending in two setiform forks. In the midst of the confusion reigning among the Sarcanthoid *Vandææ*, it seems probable that Dr. Wight's *Cottonia* (his *C. macrostachya* is *Vanda peduncularis*, Lindl.) is a good genus; and in that case the present plant appears to be included in the definition. Major Champion believes that he saw a larger-flowered species of the same genus in Mr. Braine's garden, supposed to have come from Canton. (Lindl.)

17. *Acampe multiflora*, Lindl. Fol. Orchid. pt. 4.—Common in ravines; flowering in September or earlier in the summer.

18. *Luisia*, sp.; probably *L. teres*, Blume.—From Mount Victoria; not seen in flower.

19. *Appendicula bifaria*, Lindl. MS.; foliis bifariis oblongis emarginatis mucronulo interjecto, floribus terminalibus, labello oblongo ap-

pendice circulari membranacea et dente ovato in laminam.—*Dendrobium bifarium*, Wall., Lindl. Gen. et Sp. Orch. p. 81.—*Dendrobium emarginatum*, Reinw. ic. ined.

Tolerably abundant in ravines of Mount Gough, in August.

It is uncertain whether there may not be more than one species among the plants I include under the present name, the specimens that have come under examination being generally destitute of flowers. The definition given is made to suit the plant found by Major Champion, the flowers of which I have insufficiently studied. Major Champion says they are pure white; Reinwardt's artist represents them as large and stained with rose-colour, and his leaves resemble those of the Philippine form. Rumphius's *Angracum purpureum primum*, referred here in the 'Genera and Species,' although an *Appendicula*, belongs to one of those with lateral inflorescence. Griffith's *Appendicula teres* appears to be a *Ceratostylis*. Under the name of *Appendicula stipulata*, the editor of Griffith's MSS. has made him give two totally different plants, and he says that one of them comes from Afghanistan! a country in which no epiphyte is capable of existing. (Lindl.)

20. *Limatodes gracilis*, Lindl.—*Calanthe gracilis*, Lindl. Gen. et Sp. Orch. p. 251.—Bot. Mag. t. 4714.—This is in no respect whatever different from the Khasiya and Sylhet plant. (Lindl.)

On Victoria Peak, with *Cypripedium*, in December. The plant, not unlike *Calanthe* in general appearance, has a terrestrial stem, swollen at the base, and producing a new shoot next to it annually, from one to two feet high, having six or seven, distichous, broad, plaited, satiny, bright green leaves, and upright racemes from one terete scape, shooting from the stem a little above its base. The flowers, from ten to eighteen in the raceme, are very odorous at night, with a delicious perfume like Mignonette. Pedicels nearly an inch long, arranged spirally round the scape, somewhat twisted. Sepals yellow, all equal, linear-oblong or obovate, the three exterior forming an equilateral triangle. Spur none. Column short, semicylindrical, terminating abruptly. Anther-cup opercular; pollen-masses 8, fastened by pairs to the roundish caudicle. Labellum three times as long as the column, at first convex, with a lobe at each side, then produced flatly, lobed and crimped, white with yellow spots. (Champ.)

21. *Glossaspis tentaculata*, Lindl. Gen. et Sp. Orch. p. 284.—Margins of all the hills and marshes in Hongkong, throughout the winter,

frequently in company with *Stylidium uliginosum*. The flowers and stalk are light pea-green.

22. *Peristylus chloranthus*, Lindl., sp. n.; foliis 2-3 radicalibus ovatis acutis, spica spirali, scroto ovato medio antice depresso, labello trifido laciniis linearibus obtusis. (*Lindl.*)

Common on the top of Victoria Peak, in marshy spots and slopes. The flowers, of a light green, appear about April.

23. *Habenaria linguella*, Lindl. Gen. et Sp. Orch. p. 325.—Marshy spots on the top of Victoria Peak, flowering in July. A very pretty species. The flowers are at first pure yellow, which ultimately turns to a dark brown, the process usually commencing by a dark blotch in the sepals.

24. *Habenaria Miersiana*, Champ., sp. n.; caule basi tantum foliato, foliis oblongis acutis, spica subcorymbosa, bracteis setaceo-acuminatis ovarii longitudine, labelli subrotundi trilobi lobis lateralibus grosse dentatis intermedio obtuso longioribus, petalis sepalo dorsali galeato subæqualibus, calcare arcuato clavato ascendente labello duplo longiore.

Very like the Nepal and Burmese *H. geniculata*, from which it differs in the stem being only leafy at the base, in the shorter spike, and in the spurs being very much longer than the lip, instead of the same length. (*Lindl.*)

It is a rare species, only seen by Major Champion in a ravine on the side of Victoria Peak, in September, 1847 and 1848. The flowers are pure white, with the extremity of the spur green.

25. *Platanthera stenostachya*, Lindl., sp. n.; caule folioso, foliis oblongis acutis, bracteis herbaceis setaceo-acuminatis, sepalis carnis obtusis, labelli trifidi lobo medio latiore, calcare labello duplo latiore.

Next to *P. cubitalis*, but different in its shorter and broader leaves, less leafy bracts, smaller flowers, and much shorter spur. The petals, too, are as large as the sepals. The precise station is not recorded. (*Lindl.*)

26. *Platanthera Susanne*, Lindl. Gen. et Sp. Orch. p. 295.—Common on the grassy slopes and summits of all the higher hills of Hong-kong, flowering in June with *Lilium Japonicum*.

27. *Platanthera Championi*, Lindl., sp. n.; caule dense folioso, foliis ovato-oblongis acutis, spica foliosa, sepalis lateralibus patentibus dorsali petalisque galeatis, labello obo cordato, calcare brevissimo conico.

I have the same plant from Fortune (n. 78), and from Mr. Hance (n. 105). It is very near the Nepal *P. obcordata*, but its spur is a very short cone, and not a cylinder, bluntly conical at the point. (Lindl.)

Common on Victoria Peak; flowering in July; white, variegated with lilac.

28. *Spiranthes australis*, var. *pubica*, Lindl. Gen. et Sp. Orch. p. 465.—On the top of Victoria Pass, April, 1848. The flowers are white, tinged with pink.

29. *Goodyera procera*, Hook.—Lindl. l. c. p. 493.—Mount Gough and Mount Victoria. The leaves are very glossy, and dark green. The flowers, in April, 70 to 80 in the spike, are $2\frac{1}{2}$ lines across, green and white; inodorous.

30. *Hæmaria discolor*, Lindl. l. c. p. 490.—Found sparingly in several of the ravines behind the town of Victoria, growing in dark places on rocks; also very sparingly in a ravine in the Happy Valley. Flowers in April.

31. *Zeuxine emarginata*, Lindl. l. c. p. 485.—Grows sparingly on the race-course of the Happy Valley, where it was discovered in 1850 by Col. Eyre and Dr. Thornton. The flowers, in the end of January, are white, with a reddish tinge and a bright yellow labellum.

32. *Tropidia curculigoides*, Lindl. l. c. p. 497.—Very rare in a ravine in the Wang-na-chang woods.

33. *Cypripedium purpuratum*, Lindl. l. c. p. 530.—Considered exceedingly rare when Major Champion first came to Hongkong, but now proves to be found in clefts of rocks in many of the ravines of the island, growing at a considerable elevation, and always preferring moist situations. Flowers in autumn.

The *Læliopsis Chinensis*, Lindl. in Paxton's Fl. Gard. under t. 105 (*Broughtonia Chinensis*, Lindl. in Hook. Journ. Bot. vol. ii. p. 492), described from Mr. Hinds' specimens, is not among Major Champion's plants.

There are three SCITAMINEÆ from the ravines of Mount Victoria:—*Alpinia nutans*, Rosc., *A. Galanga*, Sw., and a *Hellenia*, apparently *H. Chinensis*, Willd. Major Champion observed also a wild *Musa* in the ravines of Mount Parker, but it was without flowers or fruit.

One IRIDEA, *Pardanthus Chinensis*, Ker, was gathered at Saywan.

A single small specimen of a *Curculigo*, which appears to be the common *C. orchiioides*, Roxb., was found in grassy ravines, and a *Pan-*

cratium near the seashore, but the specimen is insufficient for determination.

The LILIACEÆ and allied families include *Lilium longiflorum*, Thunb., common on the summits of the Hongkong hills among grass, and of which a yellow-flowered variety is said to grow on Mount Parker, although not seen by Major Champion; *Barnardia scilloides*, Lindl., in ravines near Chukchow; *Dianella ensifolia*, Ait., *Asparagus falcatus*, Linn., *Ophiopogon gracilis*, Kunth, and *Smilax glabra*, in ravines over various parts of Hongkong; and several other *Liliaceæ* are said to appear in spring on the Chukchow side of the island.

A *Dioscorea*, apparently the true *D. Japonica*, Thunb., was gathered on Victoria Peak.

Several COMMELYNEÆ were seen, but no specimens were preserved.

Philydrum lanuginosum, Banks, and *Eriocaulon Wallichianum*, Mart. (*E. Cantoniense*, Hook. et Arn.), were gathered in the marshes at Saywan.

There are only five CYPERACEÆ in the collection: *Eleocharis*, a small specimen, apparently a variety of *E. acicularis*, Br.; a leafy variety of *Rhynchospora Wallichiana*, Kunth; *Scleria Chinensis*, Kunth; *Carex Indica*, Retz, and another *Carex* allied to *C. setigera*, Don, possibly new, but, in so complicated a genus, I am unwilling to describe it from a single specimen.

The GRAMINEÆ are but six:—*Setaria glauca*, Roem. et Sch.; *Arundo Reynaudiana*, Kunth, a mere variety, according to Col. Munro, of *A. Madagascariensis*, Kunth; *Erianthus Japonicus*, Beauv.; *Imperata Koenigii*, Beauv.; a *Spodiopogon*, near *S. obliquivalvis*; and *Andropogon (Cymbopogon) Martini*, Roxb.—Nees, Pl. Meyen. p. 191.

(To be continued.)

Extracts of Letters from the Malayan Islands, addressed to Sir W. J. Hooker and to W. Mitten, Esq.; by JAMES MOTLEY, Esq.

TO SIR W. J. HOOKER.

Singapore, March, 1854.

Into this very uninteresting letter, written chiefly to apologize for my shortcomings, I can find room to put one little grain of information relative to Gutta Percha. Of the original article very small quantities

are now brought to Singapore; it has become a manufactured substance. A vast variety of its gum, at various prices, from three to thirty dollars a picul, is brought in by the natives. Some of these are deep red, some quite white, and many of them are hardly coherent, breaking down and crumbling between the fingers. These are cut and broken up, and cleared from the scraps of bark and wood which are generally found among them; they are then boiled in an iron pan with cocoa-nut oil, and stirred until thoroughly amalgamated; this mixture is allowed to cool again, when it is broken up, and reboiled with more oil, sometimes as often as four times, or until the mass acquires a certain tenacity. The good Gutta Percha, sliced into thin shavings, is then added in greater or less proportion, according to the quality of the basis, and the whole well mixed. The Chinese who do this are very skilful, and manage to produce from a great variety of gums a very uniform article,—wonderfully so, when it is considered that the gum is bought by the merchants in very small quantities at a time, as the natives bring it in. Another feature in Singapore commerce during the past two years, is the increase of export of *Malacca canes*; it has been this year to the amount of many millions—what can they all be used for? Hoping yet, in spite of many disappointments, to be able in future to add some trifle to your Museum at Kew, which I long to see (when I left England it was hardly commenced), I remain, yours very truly,—J. M.

I write rather tardily to thank you for the copies of what you printed in the 'London Journal of Botany,' about the Camphor-tree. It is very singular that we should be in such ignorance of the plant which produces the Borneo Camphor, an article of commerce so long and well known, to the Dutch, at least, from whose Sumatran possessions it is mainly obtained. I am not at all surprised at Camoens' mention of it, however, because he wrote the *Lusiad* at Macao, and at that time, towards the latter part of the sixteenth century, there was a very considerable trade between that port and the north and west coast of Borneo, carried on not only by Chinese junks, which were even built in the river of Borneo Proper, but also by armed Portuguese vessels, then the two most powerful states on this coast. Brune and Sucudana had regular treaties with Portugal, and in 1602 the Portuguese resident,

or ambassador, whose first coming thither I cannot find the date of, was withdrawn from Brune upon some misunderstanding, and the Sultan was strong enough to beat off with great slaughter the Portuguese vessels of war; the then city of Brune was however burnt, and its site removed further inland.

In order to account for my not having before thanked you for the papers, I must tell you that I have been for several weeks exploring for coal in the interior of Sumatra. As my time was not my own, I was unable to collect much, and could dry no specimens, except a few of the beautiful little Lichens and *Hepaticæ* growing parasitically on leaves. How many species I send you I do not know; they seem to me almost innumerable, and many may probably be new. I send you also a lot of seeds, among which are those of three Palms; as they appeared perfectly ripe, I hope they may grow. I send also the fruit of the Gum Benjamin tree, and one of the Shiklar trees, for this last article is found on several species. Among the seeds are two very handsome *Cucurbitaceæ*, with brilliant scarlet fruit, and a very ornamental small-flowered yellow *Ipomœa*; possibly they may none of them be new, and perhaps even may be worthless, but it is better to send all than none, when I was making up a parcel; and I had one thing to send which I really think is very curious, as an instance of the instinct which teaches man to seek certain stimulants, wherever he is, independently of what is taught him by others.

In going up the river Chenaku I saw everywhere coffee planted about the houses, and in every case the fruit dropping and decaying on the ground; upon inquiring, I found these people drank an infusion of the leaves, and entirely neglected the berries. I was very anxious to taste this and see it prepared, and luckily had an opportunity of doing so. A number of young twigs of the plant were gathered, with their leaves, and, after being cut to about a foot in length, were placed closely together between two strips of bamboo, tied at the ends so as to form a dense disc of green leaves about eighteen or twenty inches in diameter. This was then held over a clear blazing fire (the ends of the bamboo serving for a handle), until the leaves were of a rich brownish-green colour, and perfectly crisp and brittle; the latter part of this process requires some care, as when nearly dry the leaves are almost as inflammable as gunpowder, and if once they catch the flame, the whole is consumed in a moment. When dry the leaves are pounded, by crush-

ing in the hand, to the state of the specimen sent you, which I got prepared for your Museum before my eyes. The powder of the leaves is infused in boiling water, exactly like tea, though in much larger quantities; it produces a dark-brown liquid, looking like coffee, smelling like green tea, and certainly tasting very much like a mixture of the two; it is very pleasant however, and refreshing after a hard day in the sun, and I can understand these people being passionately fond of it, as they certainly are. The curious part of it is, that while theine, caffeine, and theobromine have been found (nearly identical as they are in composition and properties) in use in three distinct parts of the world, and valued for the same exhilarating qualities, here is a people little raised above savages, using also in an independent manner one of these very plants, being evidently uninstructed, as otherwise they would certainly have used the berry as their teachers did, finding out for themselves its qualities and uses.

I saw, in my trip up these rivers, a great number of interesting plants, including many Palms; how very numerous must this splendid family be here! With very few exceptions, those seen were all different from my old acquaintances at Labuan; a good many of them, two of those whose seeds I send, were very slender and elegant Rattans. I saw many eatable fruits new to me, of which species of *Nephelium* were very abundant, as also Meliaceous plants, allied to the Lansat, one of the most delicious of fruits. The Durian is here in almost incredible quantities, forming in the season certainly by far the largest proportion of the food of the natives; the quantity they eat of it is perfectly astounding. Among other things worth notice, I observed a Fern very frequently proliferous from the axils of the pinnae of its fronds; I send two or three specimens of such as I could preserve, but I had only a note-book of small size to dry them in. Though comparatively valueless from my ignorance of the names of plants, I proposed sending you a copy of my Journal, but have not had time to write it since my return. I shall however do so in a few days, and will send it to you; but in the meantime I thought it best to send the seeds as fresh as possible.

There seems to be a great mystery about the Gutta Percha trees; I was in the heart of their country, and yet could get nobody to show me a single tree. I think the fact is that they have all been long ago cut down within any reasonable distance of the settlements. I saw

large quantities of the gum, though none of the best quality, on the Indragiri. I think I can distinguish at least five sorts, which are probably the produce of different trees, or rather five classes of gums, for perhaps the species are many more, and yet, though I offered great inducements, I could not get even a leaf: of course if I had gone up with time at my disposal, I would have seen the trees in spite of all, for I should have gone into the woods with the collectors, and this I hope some time to be able to do. The Gum Benjamin, another great staple here, I saw collected; the trees are about eighteen inches diameter, with small low buttresses to the roots; these are notched with a chopper, and produce the ordinary quality of the drug: the best, of a light buff-colour and dense substance, is procured from wounds in the uncovered larger roots, and the common or foot benjamin is procured from the trunk of the tree; the oil of the seeds is valued as an application to boils; it is probably of little use.—J. M.

TO W. MITTEN, ESQ.

Singapore, 1854.

My dear Mitten,—When I last wrote you, I promised to give you some account of my late trip to Sumatra, and I now sit down to fulfil that promise. The river I went up, the Indragiri, joins the sea on the east coast of Sumatra in about 35' south. It has four or five mouths, all of the size of large rivers, and between them are large islands, perfectly flat and hardly above water, covered with Nipa Palm, Mangroves, *Avicennia*, and other such amphibious plants; if there is anything else in the centre of them, which is unlikely, it will never be known, for they are too large to traverse in a day, and no human being could live a night in them from mosquitoes and miasma, though they are inhabited by myriads of wild pigs and monkeys.

As you get a little further inland, these plants give way to another species of Mangrove, a very elegant plant, with long drooping branches like a willow, and rose-coloured flowers, which bears an eatable acid fruit, and grows in the water like Mangrove; it is an Anacardiaceous plant, with corky-skinned fruit, and very venomous juice. A little palmate-leaved Palm is also very common, and a few *Orchideæ* begin to appear on the trees; this is the region of the freshwater tide, after passing which, a marked difference takes place in the vegetation, from

the absence of the Anacardiaceous plant, whose bright red young leaves make it very conspicuous. The banks are now fringed chiefly with two or three species of *Arundo* and *Saccharum*, mingled with several species of *Phyllanthus*, in habit very much like willows, the whole matted together with *Ipomœæ*, a small *Cucumis*, and a weedy-looking *Cissus*, or something of that kind. Plants here are very social in their habits. After the river's bank has been clothed for a mile or two as described, the grasses and climbers will vanish for a similar distance, giving place to a dense thicket of *Hibiscus populneus*, one of the most beautiful plants we have, though very common; the flowers are large, golden yellow, with a deep puce centre; they are however in beauty early in the morning only, unless on a cloudy day, fading after a few hours' sunshine to a dingy dirty red. This in its turn will give way to a species of *Pandanus* with long straight trunks, ten or twelve feet high, and very glaucous leaves; and here and there, where the bank has slipped down into the stream with the water-side vegetation, you get a glimpse, among the tall trunks, green and grey with Lichens and *Hepaticæ*, into the dark, swampy forest, tangled with huge creepers, and reeking with vapour. I always used to contrive, if possible, to stop at one of these places to cook, because elsewhere I could not get into the jungle. But except Cryptogams there is little to be seen; below, *Pipers*, *Pothos* and *Treycinetias* are the principal visible plants, sticking close to the trees, and a few *Arums* and *Scitamineæ* are generally to be found growing in the mud and water. I got however a few Mosses and abundance of *Hepaticæ*, but rarely in fruit; some of the latter, growing upon living leaves, are very curious. We went up the river four days before coming to any houses, which with their rice clearings materially altered the landscape; but there was not a hill to be seen two feet above the water.

The people are all Malays and Mahommedans, and are well off, and apparently happy. At this part of the river the prevailing features are the Cocoa-nut and Gomuti Palms, and vast plantations or rather jungles of Plantains; these are generally of a coarse seedy kind, but contain a great deal of farina, and are most valued as food, not as a luxury; whenever they are planted, they soon take possession of the ground, to the exclusion of everything else, and are very ornamental, as they grow to a great height and size. A vast variety of fruit-trees are cultivated, but very few vegetables; some species of *Luffa* and *Cucumis*, the

common red Pumpkin, some *Capsicums*, and one or two species of *Celosia* and *Amaranthus*, used as spinach, are nearly all, except, of course, Yams and Sweet Potatoes, which are universal here. Of sweet-scented flowers, such as Jasmines, *Michelia*, *Tabernaemontana*, and several strong-scented *Anonaceæ*, they are very fond; the Tuberose is a prime favourite, but Roses are in no esteem—they are not strong enough for Malay organs. They make amends however for the paucity of their flower-gardens by cultivating a great abundance of medicinal plants of real or fancied virtues, and about these they are never tired of talking; most of their properties are rather magical than remedial.

The object of my journey was to examine some beds of coal; so when I reached the Rajah's town, I asked him for a boat and men, mine being too big to go up the rivers. After the two or three days' delay, without which no Malay ever did or can do anything, I got them, and away we went. It was a small canoe, about eighteen feet long, and just wide enough for two people to lie down abreast, rather closely packed; in this there were nine of us, so you may believe it was rather close work, but it was a delightful trip. We went up a smaller river, called Chenaku; it was at first a black, alligatorish-looking stream, fringed chiefly with a *Ficus* with small oval polished leaves and little pink fruit, whose pendent roots dropped everywhere into the stream, which for a long distance was very tortuous. The jungle here was very fine, the most striking tree being an enormous *Terminalia*, with a candelabriform head, and a tall smooth trunk; this and an equally large Dipteraceous tree were the most common. *Calami* were in great abundance, and some very handsome: I counted sixteen species, and nearly all different to those I knew at Labuan. There was also a splendid caulescent Palm, called Ibul, with a very tall straight stem, as white as ivory, and a noble light green head, but this we did not see until we got to the hills, nearly one hundred miles from the sea. Two species of *Calophyllum* were very abundant, and, being covered with blossom, completely perfumed the air with the scent of *Rosa canina*; a splendid scarlet *Ixora*, and a climbing sensitive *Mimosa*, with yellow-white stamens, four inches long, were among the most ornamental plants I saw; another, of which I sent seeds to Kew, was a Cucurbitaceous plant, with large brilliant scarlet fruit.

The river, after going up about three days, had become shallow and rapid, so as to make the navigation of our canoe rather hazardous at

times, though the only risk was of a bath in the bright cold water, bubbling over a bed of white quartz pebbles, the very *beau idéal* of a trout-stream, and swarming with fish. Wherever the rocks came down to the water, they were covered with Ferns, many of them very beautiful, and I saw some majestic Tree Ferns here and there, but I had no means of drying them. Nothing is more remarkable than the wonderful quantity of fruit up this river, especially the celebrated Durian; my boat's crew almost lived upon them; they were so abundant as to be of no value, and we went ashore and helped ourselves, before the people's eyes, to the produce of their gardens, which was literally rotting in heaps. The Rambutan, and six or seven other species of *Nephelium*, were in equal profusion, as were also near a dozen *Meliaceæ*. A very abundant creeper was the India-rubber-producing *Urceola*; its fruit is about the size of an orange, and colour of an apricot, the thick outer skin full of milky juice, while within are about eight or ten seeds, enveloped in a tawny pulp, tasting like well-bletted Medlars; the natives use the juice only for bird-lime. I came across two curious *Scitamineæ*, one with small yellow flowers, which were generally abortive, their place being supplied by a small tuber, which drops and grows; the other, a dazzling little plant, only a few inches high, with a large bunch of scarlet and yellow flowers and bracts. Another curious plant of this tribe has large tufts of barren leafy stems seven or eight feet high, while the small red flowers hardly peep out of the ground, at several feet distance. The people here are probably aborigines, but have become Mahomedans, and call themselves Malays; they are very industrious cultivators and gutta-percha collectors, but though I was just in the district, I could not get them to show me the trees; they also procure Gum Benjamin; this I saw, and procured some seeds, which I have sent to Kew. They cultivate Coffee, but do not use the berry; they make an infusion of the parched leaf, which is very pleasant and refreshing; of this prepared leaf I also sent home a specimen. I suppose there is no such country in the world for sporting as Sumatra; elephants go about in large herds, and deer, bears, tigers, pigs, and rhinoceros are quite common. Should I go there to work this coal, which is very possible, I shall, I suppose, become quite a Nimrod. The coal I saw was very good, and very easily to be worked, but unfortunately a long way from the sea.

Do you think a collection of Grasses and *Cyperaceæ* would interest

Botanists? They are very abundant here; I think I could certainly get 150 species, probably more. I have indeed begun to collect specimens enough for twenty to twenty-five sets, and as I do this in my morning walks, which, without some such object, would become very irksome, there will be nothing lost if it will not succeed; if however you think it would do, I should feel much obliged if you would be my agent in the matter, and make the necessary announcements, for I should think it would be best to send home the first hundred or so, as soon as collected; in the meantime I will go on for my own amusement. The collection of Mosses, *Hepaticæ*, and Lichens which I am making, accumulates slowly, as there are but few species, and those not easy to get in fruit, but I keep adding one now and then: they now number about twenty species, but all are good specimens in a good state.—J. M.

Extracts from Australian Letters of Dr. HARVEY.

(Continued from vol. vi. p. 318.)

Madras Steamer, off Melbourne, Sept. 5, 1854.

I send you by post a paper by Drummond, on the Botany of the Northern Districts of the Swan River Colony [this has appeared in our Journal, vol. v. p. 115], and characters of certain new genera, which he requested me to examine and describe. The poor man feels rather sore that so many new genera should *first* have appeared in Preiss's book, which had been sent home by him (Drummond) years before Preiss visited the Colony; so I am anxious to preserve for him any little gleanings that may remain. The most curious of the genera described by me are the *Rutaceous* ones; and what I have called *Dicrastylis*, which appears to me to be either a *Cordiacea* with opposite leaves, or the type of a new Order, between *Cordiacea* and *Verbena-ceæ*. I suppose you will find specimens of all in your last set of Drummond's plants. I hope you will allow *Drummondia* to stand, as D. feels rather uncomfortable in there being no *universally acknowledged* genus bearing his and his brother's name. He himself selected and proposed this plant for a "*Drummondia*," but with your genus of Mosses staring me in the face, I had to alter the name.

I returned from Swan River to King George's Sound the beginning of August, and sailed for Melbourne on the 29th. We expect to anchor tonight before midnight. I wrote you from Fremantle in May,

when commencing the exploration of that place. I afterwards went to Rottnest Island, and spent six weeks exploring its reefs, and left them not half exhausted. Unfortunately the reefs are only accessible at new and full moon, and low-water at this season is after sunset, so that I could only have hasty wadings in the evenings, often driven away by darkness. Nevertheless I greatly increased my number of species, and dried a large box of specimens. Since my return to the Sound, I took advantage of wet and stormy days (and a fit of the gout!) to examine all my West Australian *Algæ*, naming and describing the new species. The result is, that I have collected 352 species (besides *Sargassa* and *Cystophoræ*, not examined), and mark 140 species as new. Among them are six new genera, all well characterized. There is no very wonderful structure among the novelties—no new genus of *network*. I did not myself find *Claudea*, but it was twice found in small quantity by Mr. George Clifton, while I was at Fremantle. He is a disciple of mine and an ardent collector, from whom I hope much in future. My *Martensia Brunonis*, which I sent you, I have since reduced to *M. elegans*, the African one. The whole number of *network Algæ* which I have found is nine, of which four are new species. Besides these I found a beautiful new *Kallymenia*, as big as two large cabbage-leaves, joined at the base, of a rose-red colour, and regularly pierced all over, like an *Agarum*, with round holes. I have only two perfect specimens, one of which is intended for you. Mr. Sanford gave me, from Champion Bay, a superb new *green-lace Alga* (*Struvea macrophylla*, MS.) sent by Drummond's daughter-in-law. I fear you do not remember the genus, which is described in Pl. Preiss., and of which you have the original species; but the new one has a stem supporting an oval crenated network, five inches long by three wide, resembling (it is bleached) an elegant structure of old point-lace—just what you might see on a Vandyke collar. I have only a single specimen. I am preparing a memoir on these *Algæ*, which I shall send home to be read at the Royal Irish Academy, and printed in their current Proceedings, with a view to a larger and fuller memoir, with plates, in their Transactions, after my return home. I shall have some extra copies struck off, and direct one to be sent to you, which you can notice in the Journal. The number of duplicates collected in West Australia is about 16,000; not bad work either, considering I had no assistance, and frequently had to carry my day's collections five or six miles, under an Australian sun.

My present plans are quite unfixed. Probably I shall go at once to Van Diemen's Land. I wish to go first to Port Faery, but shall be guided by what I hear at Melbourne, as to expenses, etc. If I find I can get reasonable accommodation with the pilots at the entrance of Port Phillip, I may go there for awhile. The ground looked very tempting as we entered this evening; outside the heads we steamed through a magnificent meadow of *Macrocystis*, which I longed to be boating among; all the visible fronds (tell Joseph) had long, barrel-shaped vesicles. We also passed abundance of drifting *Fucus comosus*. Neither of these are found in West Australia, where I only saw one Laminarioid plant, namely *Fucus radiatus*, Turn. I shall leave this letter to finish when I decide my plans.

Hobson's Bay, 6th April.—Not yet ashore, though we anchored last night at ten o'clock. I find there is a Steam Mail round the Horn to start tomorrow, and so close this letter.—W. H. H.

Melbourne, Sept. 15, 1854.

I wrote you a few days back, on my arrival in the harbour, enclosing some characters of new genera discovered by Drummond in his northern journey. I have now been a week in Melbourne,—some days longer than I had hoped to be, but I trust to leave it early next week. I have engaged a passage in a small coaster for Port Faery, distant about a hundred and twenty miles to the eastward of Port Phillip Heads, a position that I anticipate will be favourable for *Algæ*, and from which I may make some short land excursions. I intend remaining there a month or six weeks, then returning to Melbourne, and so to *Western Port* (a little to the east of Port Phillip), where there is a considerable tide and rocky islands, strongly recommended to me by Dr. Müller and Mr. Selwyn (Government Geologist), both of whom have been there.

Whilst delayed here waiting for the vessel, I have occupied my time chiefly with Dr. Müller, at the Botanic Garden, in looking out duplicates of his land-plants and *Algæ*, and in examining his rather considerable collection of *Algæ* made on the shores of this colony and of Spencer's Gulf. He is an excellent fellow, and wonderfully sound, for a German, in his conception of species. He is prepared to knock down many of Cunningham's, of J. D. H.'s, and even (tell it not in Dean-street) of R. B.'s. I like him much, and hope to find in him a most

useful correspondent. By the way, he is very anxious about some parcels of plants and MS. descriptions sent to you by Governor Latrobe, to whom they were entrusted so long back as October, 1853, and of which he has never since heard.* I told him I was sure you would write to him as soon as you received them. His great object is to prepare a Flora of this colony, for which purpose he travels for five or six months every year, and has explored many new localities (particularly among the *Snowy Alps*), from which he has added several interesting genera and species to the Australian Flora. He considers he has already got together some 3000 species—from this colony and South Australia—collected in the last six years. I think he deserves every encouragement, as he works up-hill every inch, in such an expensive country as this is.

I have been very little in the country as yet, except backwards and forwards to the Garden, which lies about a mile from the city, on the river-banks. The ground contains thirty acres, about twelve of which have been laid down in an ornamental garden, with broad gravel-walks and flower-beds, which are wonderfully well kept for a colony where labour is so high. As yet the collection is small, and at present the chief show is from the *Acacias*, several of which are in blossom. There is a large lagoon full of water-plants in a state of nature, and capable of much improvement. The Garden is plentifully supplied with excellent water.

The country round the city is very open, covered with grass, with scattered gum-trees, or in cultivation. There are many villages on all sides, and numerous road-side inns every mile or two. The fields are as well fenced as in England, and the roads macadamized. The first railroad was opened the day before yesterday; it is two miles long, and the charge 1s. 6d. A friend of mine, about two miles from town, turns about £2000 per annum out of an orchard-garden and eleven cows, kept on a very few acres of rich land. He had $2\frac{1}{4}$ tons of cherries last year, besides apples, plums, pears, grapes, etc. He gets 1s. 8d. per quart for all his milk, which is much cheaper than the retailed price of the *watered* milk in town. I am living at a boarding-house in a very rough sort of style, sleeping in the room with two others, and dining with a rough set of young men; but I get on very well, and have the comfort of knowing that I am with honest people. The person who

* They were all safely received.—Ed.

keeps the house is, notwithstanding his avocation, a gentleman in feeling as well as birth and education; I am therefore quite at home. Melbourne will be my *head-quarters* for letters for the next six months. After returning from Western Port about the end of November, I mean to cross over to Van Diemen's Land and put myself under Gunn's direction; and when I finish with Van Diemen's Land, I return to Melbourne to take the steamer for Sydney. This will be about May, 1855. I have just written home for additional leave* of absence till December, 1856, to enable me to visit New Zealand, the Sandwich Islands, and California, returning home by Panama and New York in the winter.—
W. H. H.

Characters of some New Genera of Plants recently discovered by Mr. James Drummond in Western Australia. By W. H. HARVEY, M.D., M.R.I.A., Keeper of the Herbarium of the Dublin University, etc.

DILLENIACEÆ.

1. *HUTTIA*, *J. Drum.*—*Calyx* pentaphyllus, foliolis ovatis acutis duobus interioribus latioribus margine membranaceis. *Petala* 5, orbicularia, brevissime unguiculata, calyce longiora. *Stamina* hypogyna, basi unita, biseriata, duo *interiora* latiora, 10 *exteriora* quorum 7 antherifera, 3 ananthera, subuliformia; *filamenta* brevissima, plana; *antheræ* apice cono cohærentes, terminales, biloculares, oblongæ. *Ovaria* 2, libera, unilocularia, ovulis geminis e basi erectis. *Styli* terminales, filiformes. *Capsulæ* . . . *Semina* arillata, arillo membranaceo. — *Fruticulus junciformis, ramosissimus, aphyllus, foliis enim squamæformibus minutissimis; floribus pedunculatis speciosis luteis; pedunculo infra medium bracteolato.*

Huttia conspicua, *J. Drum.*

HAB. Sand plains between the Hutt and the Murchison.—(Named by Mr. Drummond in honour of John Hutt, Esq., late Governor of Western Australia.)

2. *HEMISTEPHUS*, *J. Drum.*—*Calyx* pentaphyllus, foliolis navicularibus acutis, 3 exterioribus herbaceis, 2 interioribus chartaceo-membranaceis. *Petala* 5, hypogyna, calyce longiora. *Stamina* hypogyna, monadelphæ, biseriata, serie exteriore ananthera, in coronam multi-

* This, we believe, has been granted.—ED.

fidam connexa, serie interiore 6, fertilia, unilateralia; *filamenta* breviora; *antheræ* terminales, oblongæ, obtusæ. *Ovaria* 2, distincta, sericea, unilocularia; *ovulis* 2, superpositis, e sutura ventrali adscendentibus. *Styli* subterminales, filiformes. *Capsulæ* . . . — *Fru-tex erectus, ramosissimus*; *foliis alternis, linearibus, margine revolutis, supra glandulosis*; *pedunculis alaribus elongatis multifloris*; *floribus luteis unilateralibus sessilibus bibracteatis*.

Hemistephus linearis, J. Drum.

HAB. Northern districts. — This genus is closely allied to *Hemistemma*, from which its definite stamens and the different position of its ovules distinguish it. There is no difference in habit.

CRUCIFERÆ.

3. *GEOCOCCUS*, J. Drum. — *Calyx* tetraphyllus, foliolis patentibus. *Petala* 4, oblonga, exunguiculata, calyce breviora. *Stamina* 6, tetradynama, filamentis applanatis. *Ovarium* biloculare, ovatum, pauciovulatum. *Stigma* sessile. *Silicula* oblonga, subcompressa, septo latiusculo, bivalvis, valvibus membranaceis rugulosis venosis. *Semina* in loculis 3–4, ovalia, convexa. *Cotyledones* plano-convexæ, lineares, incumbentes. — *Herbula minima, annua, subacaulis*; *foliis e collo radiantibus pinnatifidis, laciniis oppositis triangularibus*; *floribus axillaribus solitariis minimis sub anthesi sessilibus demum longe pedunculatis*, pedunculo fructifero deflexo in humum siliculam celante. *Geococcus pusillus*, J. Drum.

HAB. Northern districts; among a cluster of Boordis' (a species of Kangaroo-rat) holes on the limestone part of Conolly's station. After flowering, the peduncles lengthen downward and bury the small seed-vessels about an inch underground; seeds surrounded by a mucilage, like seeds of Cress when steeped in water. — *J. D.*

PITTOSPORACEÆ.

4. *CALOPETALON*, J. Drum. — *Calyx* pentaphyllus, æqualis. *Petala* 5 (nunc 6–7), hypogyna, spathulata, unguibus curvatis in corollam subringentem conniventibus. *Stamina* 5, unguibus petalorum longioribus; *filamenta* applanata, spathulata, apice acuminato-filiformia; *antheræ* oblongæ, introrsæ, biloculares, dorso prope basin affixæ, longitudinaliter deliscentes. *Ovarium* breve stipitatum, triloculare, loculis multiovulatis. *Stylus* filiformis; *stigma* simplex. *Capsula* . . .

—Suffrutex habitu *Marianthum referens*; floribus terminalibus congestis aureo-sanguineis speciosis.

Calopetalon ringens, J. Drum.

HAB. Northern districts, on the Chapman.—This has all the habit of a *Marianthus*, but differs in the broadly-winged filaments and the three-celled ovary.

DIOSMEÆ.

5. DRUMMONDITA, Harv.—*Calyx* pentaphyllus, brevis, foliolis obtusis æstivatione imbricatis. *Petala* 5, navicularia, erecta, imbricata. *Stamina* 10, in tubum elongatum pilosum 10-dentatum arcte co-hærentia, 5 alterna breviora fertilia, 5 longiora ananthera, plumoso-barbata; *antheræ* medifixæ, erectæ, acutæ, dorso barbatae, biloculares, longitudinaliter dehiscentes. *Ovaria* 5, gynophoro 5-lobato carnosio insidentia; *ovula* gemina, collateralia. *Stylus* filiformis, exsertus; *stigma* capitatum. *Capsula* . . . —Fruticulus erectus, ramosus, *ericoides*; foliis dense imbricatis incurvis ciliolatis semiteretibus canaliculatis, glandula magna apicali glandulisque dorsalibus nigris conspersis; floribus solitariis terminalibus erectis subsessilibus; petalis flavescenscibus apice viridibus; tubo stamineo petalis longiore extus albotomentoso extra medium purpureo, intus pilis parvis pubescente, filamentis sterilibus densius barbatis.

Drummondita ericoides, Harv.

HAB. Near the summit of the White Peak, a detached hill near Moresby's Range; very rare.—This genus is dedicated to the brothers Thomas and James Drummond, two of the ablest and most indefatigable of botanical collectors and explorers; the one in North America, the other in Western Australia. That such men deserve all the honours our science can bestow, all will agree; but as yet no universally-adopted genus has been assigned to either. *Drummondia* of De Candolle has merged in *Mitellopsis*; and *Drummondia*, Hook., is not adopted by all muscologists. Lest however there should be any confusion, I have here adopted the termination "*ita*,"—being an I for James, and a T for Thomas!

6. SANFORDIA, J. Drum.—*Flores* bracteati, pedicellati. *Calyx* pentaphyllus, foliolis maximis imbricatis coloratis persistentibus. *Petala* 5, calyce multo breviora, hypogyna, navicularia. *Stamina* 10, hypogyna, petalis breviora, omnia fertilia; *filamenta* subulata, glabra;

antheræ biloculares, oblongæ, basifixæ, longitudinaliter dehiscences. *Ovaria* 5, gynophoro parvo insidentia, glandulosa; *ovula* . . . *Stylus* filiformis, exsertus; *stigma* capitatum. *Capsula* pentacocca, *coccis* mamilloso-echinatis bivalvibus, *endocarpio* subcartilagineo soluto, elastice bilobo, basi seminifero, abortu monospermo. *Semina* . . . —Fruticulus 1-2-pedalis, erectus, basi simplex, apice corymboso-paniculatus, glandulosus; ramis tomentosis; foliis dense imbricatis erecto-patentibus concavis obovatis obtusis crassis enerviis subpuberulis glanduloso-punctatis, glandulis magnis convexis; pedunculis terminalibus ternis brevibus tomentosis basi bracteatis; bracteis petaloideis citrinis; calycis foliolis magnis citrinis pellucide punctatis puberulis.

Sanfordia calycina, J. Drum.

HAB. On sand plains to the east and west of the southern branch of the Hill River, and in similar situations to the south of the Irwin. —This genus is dedicated by Mr. Drummond to W. A. Sanford, Esq., Colonial Secretary of Western Australia, who takes much interest in promoting natural history in the Colony.

7. *SYMPHYOPETALON*, J. Drum. —*Calyx* basi bibracteolatus, parvus, pentaphyllus, foliolis æstivatione imbricatis. *Petala* 5, calyce multo longiore, erecta, oblonga, hypogyna, basi et apice libera, medio longe valvatim cohærentia, æstivatione valvata. *Stamina* 10, hypogyna, petalis æquilonga; *filamenta* libera, glabra, basi squamula barbata intus aucta; *antheræ* biloculares, introrsæ, medifixæ, longitudinaliter dehiscences. *Ovaria* 5, gynophoro decemcrenato insidentia, glabra; *ovula* in loculis gemina, oblique superposita. *Stylus* filiformis. *Capsula* pentacocca, *coccis* transversim rugulosis, *endocarpio* soluto. —Frutex parvus, ramosus, foliosus; foliis sparsis petiolatis oblongis uninerviis convexis obtusis, supra glabris pellucide punctatis, subtus dense squamosis, squamulis peltatis argenteis; floribus solitariis pedicellatis axillaribus rubris.

Symphypetalon corraeoides, J. Drum.

HAB. Near Middle Mount Barren.

8. *UROCARPUS*, J. Drum. —*Calyx* minimus, 5-dentatus. *Petala* 5, obovata, patentia, calyce multo longiora. *Stamina* 10, hypogyna, petalis subæqualia, omnia fertilia; *filamenta* filiformia, glabra; *antheræ* ovatæ, muticæ, dorso supra basin insertæ, biloculares, longitudinaliter dehiscences. *Ovaria* 2, opposita, sutura ventrali cohærentia,

apice truncata, angulis dorsalibus porrectis, lateribus compressis. *Styli* duo in unicum glabrum coaliti; *stigma* incrassatum, bilobum. *Capsula* dicocca, coccis cornutis, bivalvibus, endocarpio cartilagineo, elastice soluto, abortu monospermo.—Fruticulus *habitu* *Phebaliis* *simillimus*, *pube squamosa vestitus*; foliis *ovatis basi in petiolo angustatis*; floribus *albis terminalibus umbellatis*, pedicellis *filiformibus squamosis*.

Urocarpus phebaloides, J. Drum.

HAB. By the side of a watercourse, east side of Mount Lesueur, rare. —Very similar in general aspect to *Phebalium grandiflorum*, but smaller, and differing essentially from *Phebalium* in its ovary and fruit.

PHYTOLACCEÆ?

MACARTHURIA apetala, Harv.; ramis scirpoideis ramosissimis, foliis paucis sparsis angustissime linearibus mucronatis, cymis paucifloris, floribus apetalis octandris trigynis.

HAB. Northern districts. —I introduce this species for the purpose of calling attention to the natural position of the genus *MACARTHURIA*, Hug., which appears to be very ill placed in *Büttneriaceæ*, and perhaps may be better associated with *Phytolacceæ*, with which Order it agrees in habit. The present species is much more slender than *M. australis*. I have examined many flowers of both, and never found more than eight stamens in any; as is also stated by Steetz in the appendix to Pl. Preiss.

CUNONIACEÆ.

9. *PLATYPTELEA*, J. Drum.—*Calyx* tubo turbinato, cum ovario connato, limbo semisupero quadripartito persistente fructifero aucto. *Petala* . . . *Stamina* 8. *Ovarium* basi cum calycis tubo adnatum, apice liberum, conicum, quadriloculare. *Styli* 4, discreti, filiformes; *stigmata* simplicia. *Capsula* calycis tubo tetragono adnata, limbo aucto stellatim patente coronata, abortu unilocularis, monosperma.—Suffrutescens *graciles, glabri*; ramis *volubilibus*; foliis *oppositis linearibus integerrimis vel remote serrulatis*; floribus *oppositis pedunculatis*, pedunculo *articulato* (i. e. cyma *uniflora*).

Platyptelea clematidea, J. Drum.

HAB. Crevices of limestone rocks in the Champion Bay district. —The specimens examined were in fruit. The stamens had fallen,

leaving *eight* scars round the throat of the calyx. The genus will stand near *Ceratopetalon*, Sm.

MYRTACEÆ, Sec. Leptospermeæ.

10. *CHEYNIA*, J. Drum.—*Flores* axillares, solitarii, pedicellati, basi bi-bracteolati. *Calycis* tubus cylindricus, supra ovarium longe productus, fauce annulo carnosio auctus; limbus quinquepartitus, laciniis leviter imbricatis patentibus. *Petala* 5, annulo calycis inserta, ob-ovata, decidua. *Stamina* plurima, cum petalis subæquilongis inserta, inæqualia, libera; *filamenta* subulata; *antheræ* adnatæ, introorse, longitudinaliter dehiscentes, connectivo gibboso. *Ovarium* adnatum, 5-loculare, loculis multiovulatis. *Stylus* filiformis, exsertus; *stigma* capitatum. *Capsula* . . . —Fruticulus *multiceps*, *decumbens*, *ramosissimus*, ramis *majoribus prostratis*, ramulis *erectis confertis foliosis*; foliis *minutis ericoideis oppositis tetrastichis rigidis pellucidopunctatis ciliatis mucronulatis carinatis*; floribus *speciosis coccineis*.

Cheyenia pulchella, J. Drum.

HAB. Northern districts.—Named by Mr. Drummond in honour of Mr. and Mrs. George Cheyne, of Cape Riche, to whom "he is under more obligations for assistance in his botanical pursuits than he can easily repeat."—*J. D. in litt.*

DICRASTYLÆ, MS. (inter *Verbenaceas* et *Cordiaceas* media?)

11. *DICRASTYLIS*, J. Drum.—*Calyx* 5-partitus, foliolis linearibus extus plumoso-lanatis. *Corolla* gamopetala, hypogyna, infundibuliformis, regularis, 5-fida, laciniis æqualibus erecto-patentibus. *Stamina* 5, corollæ laciniis alterna, fauce inserta, exserta; *filamenta* filiformia; *antheræ* didymæ, breves, supra basin insertæ, longitudinaliter dehiscentes. *Ovarium* disco carnosio insidens, liberum, biloculare; *ovula* in loculis gemina, collateralia, placentæ axillari affixa. *Stylus* tomentosus, profunde bifidus, vix exsertus; *stigmata* simplicia. *Fructus* . . . —Suffrutices v. herbæ *lanatæ*, *ramosæ*; foliis *oppositis subsessilibus integris*; inflorescentia *corymboso-paniculata vel subcapitata terminali*.

1. *Dicrastylis fulva*, J. Drum.; erecta, tomento stellatim ramoso et plumoso fulvo, foliis tomentosis ovalibus sessilibus integerrimis, panicula repetite trichotoma, floribus longiuscule pedicellatis.

HAB. Northern districts.

2. *Dicrastylis reticulata*, J. Drum. ; crecta, tomento stellato-ramoso albido vel fulvescente, foliis viridibus ovato-oblongis crenulatis subtus reticulatis, panicula subcapitata.

HAB. Northern districts (n. 94).

3. *Dicrastylis Stachas*, J. Dr. ; diffusa, tomento lanoso niveo, foliis linearibus margine revolutis crenulatis lanatis subtus demum nudiusculis, glomerulis ramos foliosos terminantibus.

HAB. Northern districts (n. 95).

HÆMODORACEÆ.

12. *MACROPIDIA*, J. Drum. (Kangaroo's foot, Col.)—GEN. CHAR. *Perigonium* corollinum, lanatum, tubo basi cum ovario connato elongato ore obliquo (tandem deciduum ?) ; limbi sexfidi laciniis patentibus adscendentibus. *Stamina* 6, fauci perigonii inserta, exserta ; *filamenta* adscendentia ; *antheræ* adnatæ, longitudinaliter dehiscentes. *Ovarium* triloculare ; ovula in loculis *solitaria* ! peltata. *Columna* maxima, triloba. *Stylus* filiformis. *Capsula* loculicido-trivalvis.—Herba *perennis*, *habitu omnino* Anigosanthes ; *differt tamen ovulis solitariis*.

Macropidia fumosa, J. Drum.

HAB. Northern districts.

LILIACEÆ.

- XANTHORRHŒA Drummondii*, Harv. ; trunco elato simplici, foliis rectangule tetragonis, amento cylindrico longissimo (4–8-pedali), bracteis fasciculorum flore subbrevioribus apice barbatis, perigonii foliolis imberbibus.

HAB. On dry hills, near Perth and elsewhere.—This is the largest and finest of the genus, and produces the most valuable gum. It is readily known from the common *Black-boy* (*X. Preissii* ?) by the *square*, instead of *rhomboidal* section of its leaves, which are of a bluish-green colour and far less brittle.

NAIADÆÆ.

13. *LEPILÆNA*, J. Drum.—*Flores* monoici, terminales v. pseudo-axillares, solitarii v. cymosi. *Masculi* solitarii vel terni ; flos medius nudus, laterales spatha membranacea bipartita absconditi, brevissime pedicellati. *Perigonium* minutum, trisquamosum, squamis obtusis.

Anthera 3, monadelphæ, sessiles, margine arctissime cohærentes, biloculares, extrorsæ, longitudinaliter dehiscentes; pollen sphaericum: —*Feminei* furcis ramorum solitarii, nudi, pedunculati, pedunculo fructifero elongato. *Perigonium* triphyllum, foliolis acutis. *Ovaria* 3, libera, dorso carinata, facie contigua, demum pedicellata, unilocularia; *ovulum* unicum, pendulum. *Drupæ* 3, v. abortu pauciores.—Herba *aquatica*, *Ruppiaë facie*. Caulis *dichotomus*. Folia *angustissima*, *basi vaginantia*, *minutissime serrulata*, *acuta*.

Lepilæna australis, J. Drum.

HAB. Common in the Colonial rivers.

BOTANICAL INFORMATION.

Note on the Vegetation of Roumelia and Bulgaria.

Lieutenant-Colonel Cocks presents his compliments to Sir William Hooker, and begs to send him a copy of his rough notes on the wild flowers, shrubs, and trees in Roumelia and Bulgaria,* trusting that they may prove of interest, in case some good botanist has not already communicated his researches in these countries; as Colonel Cocks is obliged to acknowledge that he knows but little of the matter in a scientific point, and has merely picked up a smattering from an intense love of his garden. However, if Sir William will take these notes for what they are worth, they are entirely at his service.

The common scrub of Bulgaria is composed of dense bushes of *Paliurus aculeatus*, *Rhus Cotinus*, and the common stove Berberry, intermixed with small trees of the Hop Hornbeam, and some small Oak, making the whole of the country like one vast shrubbery, particularly pretty when the *Paliurus* and *Rhus Cotinus* are both in flower, the former making a bright yellow blaze, and the *marabout feathers* of the *Rhus Cotinus* giving a hazy, misty look, as if the setting sun was shining on a cloud, giving it an orange and crimson tinge. The flowers beneath are Sweet William, or something akin to it; the large brilliant *Lychnis fulgens*, looking like a bright crimson Carnation; *Erythraea*, the common

* We are sure that any observations upon the vegetation of countries bordering on the Black Sea will be read with interest, even though written by one who will not allow himself to be considered a Botanist.—ED.

Centauray, a yellow *Geum*, two varieties of *Campanula*, a *Statice* growing in pure dry sand, a harsh branching dwarf variety, with pale whitish flowers; several varieties of the family *Borago*, including Viper's Bugloss, and a most lovely capitate *Lithospermum*, with bright ultramarine flowers with a brilliant white eye, which would have been a great acquisition to the bedding garden, if I had been fortunate enough to have procured seed later in the year. This, with the *Statice*, and the yellow *Immortelle*, and a pink *Helichrysum*, were all growing in a sandy waste at Aladyn, among some curious rocky columns of natural formation. Some of the small trees were enveloped in garlands of Traveller's Joy (*Clematis Vitalba*). Large Thistles were in great quantities, with fine crimson heads. Growing about two feet high, and climbing among the shrubs, was a lovely large white Convolvulus, nearly as large as a coffee-cup; and amongst twiners were Vines, Bryony, and a shining heart-shaped leaf, with thorny, tough stems, very like a *Smilax*, but could not find a flower. Not a Fern, Lichen or Moss to be found. I found a Pæony in seed once or twice, and some fine *Verbascum*, particularly a branching variety, which I take to be "*remigerum*," looking like a plant of common Broom. There was an herbaceous plant which I did not know, growing in a spike with flowers of a dirty white, prettily veined with brown, with an intensely white lip; * and the Thorn Apple, *Datura Stramonium*, was very common, as also the common Flax and Hemp.

In the neighbourhood of the Bosphorus the trees which take your eye most are the Oriental Planes, some of them of gigantic size; and the banks from Stamboul to the Black Sea are gay in the spring with *Erica arborea*, *Cystus*, wild Lavender, Judas-trees, interspersed with which are dwarf shrubs of *Arbutus Unedo*; and in the hedges are found the true Damask Rose, with a peculiar and delicate scent, the foliage looking as if covered with an impalpable powder, the flowers of a very delicate flesh-colour; and *Jasminum revolutum* in quantities; Sweet Bay; *Quercus coccifera*, bearing on the leaves, in spring, a scarlet bladder coccus. Some very pretty varieties of Oak: one dwarf, with very downy young foliage, grey and woolly; one with very minute acorns, looking as if made for a lady's head-dress; another, very large and pendulous; also *Crataegus Pyracanthus*, and Privet. The Castor-

* I opened one of the flowers and made a slight sketch: the way it grew was like a Mullein.

oil plant grows there in gardens to the size of apple-trees; and in the "Prince's Islands," opposite Stamboul, is an *Acacia*, called by the Turks "Ambeer," very like *A. affinis* in foliage and flower, excepting that in place of flowering in the spring, they are produced in September, when the Greeks pick the round yellow blossoms, and after fastening them to sprigs of *Arbor-vitæ*, they decorate their churches; and the Turkish ladies place the flowers among their clothes, as they have a strong aromatic smell, something between pine-apple and sandal-wood. There is a fruit called "*Acrania*," either *Prunus* or *Cerasus*, like an elongated carnelian cherry, very astringent in taste, making a delicious drink after stewing and mixing in cold water; the foliage like the Spindle-tree; but I could not find out its name, but have given James Veitch, jun., some of its elongated stones, which are something like those of a Date. There are whole fields of purple and pink Larkspur about Scutari, but whether wild or cultivated, I could not discover, though often evidently self-sown. The only Ferns were *Lastrea aculeata* and *Pteris aquilina*.

Treverbyn-vean, Liskeard, January 8, 1855.

Nomenclator Filicum.

We gladly give increased publicity to a notice that has appeared in the forty-ninth number of the 'Beilage zur Botanischen Zeitung,' for December 8, 1854, respecting a *Nomenclator Filicum*, which is in preparation by Dr. J. W. Sturm, of Nürnberg. All engaged in publishing on phænogamous plants feel the value of Steudel's 'Nomenclator:' but this will go further than that, for under each species a full synonymy will be given, references to figures and localities, with the respective authorities for the countries named.

"From the extent," says Dr. Sturm, "to which the study of Ferns is carried, and the zeal of numerous collectors in foreign countries, our collections of Ferns have so much increased, that the number of known species may be estimated at about 5000.

"The number of works on Ferns has increased *pari passu* with the number of species; this is proved not only by such excellent large works as those of Fée, Hooker, Kunze, Presl, etc., and by many valuable Monographs, but also by the publication of great numbers of new species in scientific periodicals and elsewhere.

"It is to be regretted that no general work exists, containing an enumeration of all these detached indications, and giving an estimate of the number of species in each genus at the time of its publication.

"The earlier enumerations of Ferns in Willdenow's 'Species Plantarum,' Sprengel's 'Systema Vegetabilium,' and in Steudel's 'Nomenclator,' have become defective, and no longer suffice. Greville's and Hooker's 'Enumeratio Filicum,' in Hooker's 'Botanical Miscellany,' vol. iii., has never been completed; and Hooker's 'Species Filicum,' which was commenced ten years ago, progresses so slowly, that its early completion can scarcely be hoped for.

"As by Kunze's death, which took place much too soon for science, his resolution of publishing a 'Synopsis omnium Filicum' has unfortunately not been fulfilled, I have resolved, in order to possess the means of reference to all published materials, to prepare, within a year, a Nomenclator of all Ferns (in the widest sense), published up to the end of the year 1854, which I propose to complete as speedily as possible, unless the desire expressed by Presl in the preface to his 'Epimeliæ Botanicæ,' should be forthwith fulfilled, that some one should be found who, with complete materials and preparation, should undertake a task which must be considered the most important object of Pteridography, namely, a 'Genera et Species Filicum,' according to the newest views.

"As I wish to give the earliest intelligence of the work which I have undertaken, I subjoin some specimens, which will show the mode of arrangement, as well as the extent to which I propose to carry this Nomenclator, and I request, for the use of science, that all pteridologists will be good enough to assist me with counsel and material."

SPECIMEN OF J. W. STURM'S 'NOMENCLATOR FILICUM.'*

1. *Adiantum cuneatum*, Langsd. et Fisch. Ic. fil. Bras. p. 23. t. 26. (1810).

Willd. Sp. pl. V. p. 430. n. 45.—Kaulf. En. fil. p. 206.—Raddi fil. Bras. n. gen. et sp. p. 59. t. 78. f. 2.—Hook. et Grev. Ic. fil. t. 30.—Spreng. Syst. veg. IV. p. 114. n. 51.—Link H. Berol. II. p. 18. n. 13.—Presl Tent. p. 158. (nomen).—Kze. Comment. ad Martii Herb. fl. Bras. n. 353. in Fl. 1839. l. Beibl. p. 42.—Link Fil. sp. H. Berol. p. 72. n. 13.—Klotzsch in Linnaea XVIII. 1844. p. 556.—Kze. Ind. fil. cult. Linn. XXIII. 1850. p. 215. n. 28.—Hook. Sp. fil. II. p. 39. n. 80.—Fée Gen. fil. p. 114. (nomen).

A. Radclianum, Presl Tent. p. 158. (nomen c. syn. Raddi t. 78. f. 2.)

Brasilien. (Sellow, Tweedie, Dryas, Gardner n. 196.), St. Catharina (Langsd.,

* With respect to these specimens, it must be observed that they pretend to no completeness, my manuscript being not yet finished.

Chamisso, Raddi).—Uruguay (J. Baird).—Peru (Ruiz Herb. n. 24).—Columbien (Moritz n. 166. 167 et 168).

2. *Cystopteris rufescens*, Fée Gen. fil. p. 300. n. 2. (1852).

Ejusd. Iconogr. (VI. Mémoire) p. 22. t. 6. f. 5.

Cuba. (Coll. Linden n. 1877.)

3. *Davallia Cumingii*, Hook. Spec. fil. I. p. 155. n. 12. t. 45. B. (1844).

Kze. Recens. Hookeri Spec. fil. bot. Ztg. 1850. p. 54. n. 12.

D. lepida Presl. Tent. pterid. p. 128.

Humata pedata J. Smith En. fil. Phil. in Hook. Journ. of Bot. III. p. 415.

Pachypleuria lepida Presl. Epim. bot. p. 99. n. 9.—Fée Gen. fil. p. 322. (nomen).

Philippinen : Ins. Samar (Cuming n. 138). Luzon and Manila (Meyen).

Botany of Ceylon and Botanic Garden of Peradenia.

Our valued friend, Mr. Thwaites, has recently published a very favourable Report on the Royal Botanic Garden of Peradenia, and, without neglecting the scientific bearing of the Establishment, is judiciously directing a large portion of his attention to the introduction and cultivation and distribution of *useful* plants. The best *West Indian Ginger*, various kinds of *Cotton*, *Manilla Hemp*, *Chinese Grass-cloth plants*, the choicest *Pine-apples*, *Argan* from Marocco, *Shiraz Tobacco*, *Cochineal Insects* as well as plants, *Brazil wood*, and numerous *ornamental plants*, have been, within the year, imported and increased in the nurseries, and have been more or less dispersed according as they have multiplied. A Museum and Economic Department are formed, and attention is directed to the various fibres yielded by native plants, of which there is no lack, and samples are submitted to the Chamber of Commerce, so that their market value may be ascertained. Models of machines for the preparation of fibres are recommended to be deposited, in order that the native Headmen and others may see them in operation.

With the ready co-operation of the Government agents and other gentlemen, Mr. Thwaites is preparing a very complete collection of the oils and gums and other vegetable products of the country, and samples of each are to be sent to England in order that their value may be ascertained. With such objects in view, the Botanic Garden cannot fail to be of public service, and to merit the warmest support of the Colonial Government.

Every year Mr. Thwaites's excursions enable him to add many new

species to the Flora of Ceylon. The native Herbarium now contains 2767 species, including Ferns, but exclusive of other *Cryptogamia*. Draughtsmen are employed to make drawings of new plants, and much of Mr. Thwaites's time is devoted to preparing and sketching the analyses, with a view to the publication of a complete Flora of the country.

Expedition to Sicily and the neighbouring Abruzzos.

Messrs. Huet du Pavillon, of Geneva, known to the Botanists as able collectors of Plants, will visit during this spring and summer these interesting parts, with the intention of collecting specimens of their rarer species. They undertake this tour on subscription. Friends of Botany, who are willing to promote this undertaking, and to share of its results, are requested to subscribe by a payment of 50 francs (£2 sterling), which can be paid for my account to Charles Young, Esq., 8, High Street, Islington, who will furnish to subscribers two quittances, one of which the subscriber will please to remit to me. The advantages of subscription are a right to a more complete collection and to a lower price, viz. at 16s. sterling per 100. If desired, these and other plants, which should be ordered, can be delivered free of freight, etc., in London at a moderate rate. Letters post-paid.

R. F. HOHENACKER.

Esslingen, near Stuttgart, January, 1855.

New Collections of Dried Plants to be procured from R. F. Hohenacker.

Kotschy, Pl. Montis Tauri Ciliciæ, anno 1853 collectæ. Determinatæ a D. D. Boissier, Fenzl, Schott, Antoine et Kotschy. 200-400 species (in about 220-500 specimens), fruits and specimens of wood. A collection distinguished by the very interesting species of Conifers and Oaks contained in it. Price of 100 species, £1. 5s. 9d.

Professor Orphanides, Flora Græca exsiccata. Centuria I.-III. Determinatæ a Boissier. £4. 17s.

Lechler, Pl. Chilenses, Sect. 1. Determinatæ a Miquel, Grisebach, Bentham, Schultz, Steudel, cæt. 100-160 species. £1. 5s. 9d. per 100 species.

Lechler, Pl. Ins. Maclovianarum. Determinatæ ab iisdem Botanicis. 25-40 species. £1. 13s. 5d. per 100 species.

Lechler, Pl. Freti Magellanici. Determinatæ ab iisdem Botanicis. 100-200 species. £1. 13s. 5d. per 100 species.

Philippi, Pl. Chilenses, Sect. I. et II. Determinatæ ab iisdem Botanicis. 60-200 species. £1. 5s. 9d. per 100 species.

Noë, Pl. Kurdistanæ, Mesopotamiæ, cæt. Determinatæ a Boissier. 50-100 species. £1. 7s. 5d. per 100 species.

Boivin, Pl. Ins. Borboniæ. Determinatæ pro parte a Botanicis Parisiensibus. 50-200 species. £1. 10s. per 100 species.

W. Schimper, Pl. Abyssiniæ. Ed. 2, a Hochstetter revisa. 100-500 species. £1 per 100 species.

Algæ Marinæ siccatae, Sect. I.-IV., with notes by Dr. Rabenhorst and Von Martens. Folio, neatly bound; each part, containing 50 species, 12s.

Huet du Pavillon, Pl. Armeniæ. Determinatæ a Boissier. 100-300 species. £1. 4s. per 100 species.

Huet du Pavillon, Pl. Sardinia et Alpium Penninarum oppido Chiavari vicinarum. 100-200 species. £1 per 100 species.

Huet du Pavillon, Pl. Alpium Pedemontanarum; Mont. Tende, Mont. Cenisii, cæt. 100-200 species. 12s. per 100 species.

In a few weeks will be published: Becker, Pl. rariores Desertorum Volgæ inferioris. Determinatæ a C. A. Meyen. 100-125 species. £1. 4s. per 100 species.

W. Schimper, Pl. Abyssiniæ nondum editæ.

New Proteaceæ of Australia.

All interested in Australian botany will be glad to learn that Dr. C. F. Meisner has drawn up characters of the recently-imported species of PROTEACEÆ of Australia, mainly, we hardly need say, from the rich collections of Mr. Drummond, whose sixth and latest set of Western Australian plants Dr. Meisner reckons to contain 44 new species out of 50; and he observes, that since the year 1810, 400 new species have been added to the 204 contained in Mr. R. Brown's 'Prodromus,' viz. 163 by Mr. Brown, 48 by Dr. Lindley, and 195 by himself (Dr. M.). The paper in question has been read at the Linnean Society, and will be published in some of the very early numbers of the present Journal.



Enkianthus himalaicus

Enkianthus himalaicus
Fr. 21. 100.

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New PROTEACEÆ of Australia; by C. F. MEISNER.

[Read at a Meeting of the Linnæan Society, January 16, 1855.]

Few Orders of Phanerogamous plants have increased in so great a proportion, by the discovery of new species, during the last forty years, as that of *Proteaceæ*, especially in the Australian branch of the family, as the original stock of which must be considered the 204 species, comprised in 23 genera, contained in Mr. R. Brown's 'Prodromus Floræ Novæ-Hollandiæ' (1810). In the Supplement to this work (1830), Mr. R. Brown has published the new *Proteaceæ* discovered in various parts of New Holland by A. Cunningham, Baxter, Fraser, Caley, and Sieber, amounting to 163 species, including one new genus. The next considerable addition (we omit the few new *Proteaceæ* published in various works and periodicals) was due to Mr. James Drummond's discoveries in Western Australia, of which Dr. Lindley gave an account in his 'Sketch of the Vegetation of Swan River' (Bot. Reg. for 1839, Append.), which contains 48 new species of *Proteaceæ*. In the two volumes of the 'Plantæ Preissianæ' (1844-48), the author of the following pages has described the new species found in the same part of Australia by L. Preiss, as well as those contained in Mr. Drummond's subsequent collections (Series i.-iii.), amounting to 90 new species (the supposed varieties not included). Since then, the rich materials supplied to him, chiefly by the liberality of British botanists, during his visit to England and Scotland in 1850, and for which he gladly takes this opportunity of expressing publicly his warmest thanks, have enabled him to correct some errors committed in his former paper, and to establish 61 new species, of which a list has been published in 1852, in Nos. 42 and 43 of this Journal, at pages 180 and 207. The additions to the Family however have always been in progress, even during the last two years, chiefly through the exertions of the indefatigable Mr. Drummond, of whose extensive travels in several hitherto unexplored parts of Western Australia some account has been given by himself in this Journal for 1853, pages 115, 139, 177, 344, 398. His fifth series, and the supplement to it, are the only part of his collections of which I had not the opportunity of examining a complete set; but I am indebted to the kindness of Mr. R. Kippist for very accurate definitions, partly accompanied with drawings and fragments, of such *Proteaceæ* contained in them as he found to be new on examining the

set of Mr. W. W. Saunders, and comparing the specimens with several London herbaria, and I thankfully avail myself of his permission to publish them in the following pages. The sixth series of Mr. Drummond's plants, which has reached us but lately, is proportionally one of the richest in *Proteaceæ*, which form about one-fifth of the whole set, and contain not less than 44 new species out of 50 numbers!

To conclude this survey, by summing up the above-mentioned additions, we find that since the year 1810 upwards of 400 new species have been added to the 204 contained in Mr. R. Brown's 'Prodromus,' viz. 163 by Mr. R. Brown, 48 by Dr. Lindley, and 195 by the author of the present account. It is a very remarkable fact that such a large increase of species has not added to this Order one single new genus, nor even produced any important alteration in the characters and limits of the established ones,—a new and most signal proof of the acuteness, and of the deep and sound sense of the "idea generis" with which they were founded by the immortal monographer of *Proteaceæ*. Indeed, I can only mention two plants which, disagreeing in several respects with all the known genera, will probably prove to be new ones; but unfortunately they were both found only in fruit, and collected in so few and scanty specimens, that we were unable to ascertain, with sufficient accuracy and completeness, their generic characters. The one of them, being in Drummond's coll. vi. n. 190, will be mentioned hereafter under the name of *Grevillea? cynanchicarpa*; the other was found by Mr. Strange near Moreton Bay, a single specimen, which I have been allowed to examine. These two plants resemble one another in habit, foliage, and in solitary, axillary, oblong, woody, one-seeded? foliicles, but appear to differ in the structure of the seed. That of Moreton Bay, for which I would propose the name of *Strangea*, in memory of its discoverer, has pendulous foliicles (about $1\frac{1}{2}$ inch long, 6 lines broad), attenuated at both ends, bearing no remains of style or stigma, compressed, with nearly flat and quite smooth and even sides, very blunt one-grooved edges, in the middle of which they split the whole length, forming two perfectly similar valves. The specimen bears only two foliicles (in the lower axils of the branch), the upper one apparently quite developed, but only beginning to split on one edge, and showing the nerviform margin of the seed, which we durst not take out, for fear of spoiling the specimen; the other apparently less perfectly developed, though already split to the base into two narrow, convex, and rather

thick valves, which are scarcely concave, and of a somewhat spongy texture on the inner side, with one single unripe blackish seed, which is 10 lines long, 3 lines broad, lanceolate, tapering at both ends, flat and membranous, bordered on one side with a slightly thickened nerviform margin. Evidently this plant, although approaching in habit to some *Hakeas* and *Persoonias*, especially *P. linariifolia*, A. Cunn. (*P. tenuifolia*, R. Br.), cannot be inserted in any of the known genera. The species may be defined thus:—*Strangea linearis*, Nob.; glabra, ramis gracilibus, foliis sparsis erectis anguste lineari-spathulatis (2 poll. longis, 1–2½ lin. latis) obtusis muticis planis subnerviis crassiusculis, pedunculis axillaribus 1-floris (3 lin. longis crassiusculis) calyce toto deciduo . . . , folliculis oblongis compressis utrinque acuminatis.—Of the *glandulæ hypogynæ* no trace could be found.

1. *Petrophila triternata*, Kippist in litt.; ramulis velutinis, foliis rigidis teretibus triternatis exsulcis scabris junioribus tomentoso-pubescentibus, lobis divaricatis pungentibus petiolo subduplo longioribus, capitulis terminalibus ovatis, squamis ovato-lanceolatis, extimis glutinosis pungenti-acuminatis, interioribus majoribus apice calvis striatis deciduis, calycis laminis crispato-villosis, stigmate fusiformi barbato haud articulato basi glabro, nucula compressa obovata emarginata longe comosa, faciebus glabris.—*Drummond*, coll. v. Suppl. n. 2.

In many points resembling *P. Drummondii*, but the heads are much larger, the flowers more densely tomentose, the seeds broader, almost orbiculate, and above all, the leaves quite different.

2. *Petrophila circinata*, Kippist in litt.; ramulis pubescentibus, foliis longe petiolatis teretibus bi-tripinnatis 4–5-jugis circinato-recurvis glabris supra 1-sulcis, segmentis divaricatis semiuncialibus pungentibus, petiolo basi dilatato, capitulis terminalibus ovatis, squamis late ovatis sericeo-tomentosis, infimis folio nano terminatis, superioribus mucronatis, calyce sericeo-villoso (lutescente), stigmate fusiformi hispidulo superne glabro, nucula—*Drummond*, coll. v. Suppl. n. 3.

It comes very near *P. divaricata*, but differs in having terminal and much larger flower-heads, and the pubescence of the calyx longer and more lax, the stigma longer by one-half, obtuse, etc. Leaves 3–5 inches, segments ½ inch long.

3. *Petrophila conifera*, Nob.; ramulis apice puberulis, foliis rigidissimis teretibus exsulcis lævibus glabris extra medium pinnatim 3–5-

fidis basi attenuatis, lobis divaricatis pungentibus, lateralibus indivisis bifidisve, capitulis terminalibus ovato-oblongis, squamis basi connatis lignescentibus acuminulatis sericeo-tomentosis, floribus . . . , nucula lenticulari ovata acuminata margine villosa.—*Drummond*, coll. vi. n. 167.

Approaching *P. canescens et rigida*, but distinct from both in the grooveless and less divided leaves, which, besides, are thicker than in the former, and pungent, and not rugoso-striate, as in the latter. Leaves $1\frac{1}{2}$ inch, segments 3–6 lines long.

4. *Petrophila chrysantha*, Nob.; ramis apice cano-tomentellis, foliis pinnatim 3–9-partitis complicatis glabris, lacinii teretibus pungentibus indivisis supra 1-sulcis scabriusculis subparallelis, capitulis terminalibus folia æquantibus parvis, squamis basi connatis margine villosiusculis, calyce aureo-villoso, laminis muticis, stigmate fusiformi haud articulado, nucula subrotundo-ovata adpresse pilosa margine villosa ala acuta glabra terminata.—*Drummond*, coll. vi. n. 165.

Very near *P. Serruriæ*, but the leaves and flowers are smaller, the laciniae undivided and not divaricate, and the laminæ of the calyx have no appendage at the top. Leaves 6–9 lin. long, pilose when young.

5. *Petrophila inconspicua*, Nob.; ramulis patenti-pilosis, foliis teretibus pinnatim 3–5-partitis scabriusculis glabris supra 1-sulcis, lobis subparallelis mucronulatis, capitulis terminalibus foliis superatis, squamis pilosis, calyce breve albo-villoso, laminis muticis, stigmate parvo conico-subulato, samara complanata glabra ciliolata(?).—*Drummond*, coll. vi. n. 172.

In habit, form, and size of the leaves, almost like *P. chrysantha*, but quite distinct in the stigma. The flowers also are a little longer, and the segments of the leaves, though acute, scarcely mucronulate.

6. *Petrophila axillaris*, Nob.; ramulis cano-tomentellis, foliis sessilibus rigidissimis bipinnatis subtripinnatisque lævibus glabris, pinnis 2–3-jugis divaricatis, basilaribus cæteris duplo brevioribus 2–3-lobis, pinnulis anguste linearibus pungentibus planis subtus convexis obsolete bisulcis, capitulis axillaribus sessilibus ovatis folium subæquantibus, squamis sericeis, calyce argenteo-sericeo, laminis setula brevissima terminatis, stigmate fusiformi inarticulado, nucula . . . —*Drummond*, coll. vi. n. 166.

Allied to *P. striata*, but differing in the involucre being smaller, with acute scales, the segments of the leaves narrower and less distinctly

striate, the filiform appendage at the top of the sepals much shorter and hidden in the pubescence, and above all, the stigma not being jointed. The leaves are 1-1½ inch long, and in circumference nearly orbicular.

7. *Petrophila bitermata*, Nob.; ramulis cano-tomentellis, foliis rigidissimis attenuato-subpetiolatis bitermatis lævibus glabris, segmentis divergentibus linearibus planis nervoso-striatis petiolo duplo latioribus cuneatis apice 3-lobis, lobis lanceolatis pungenti-acutis, capitulo terminali globoso, squamis viscidis? acuminatis, exterioribus glabriusculis, interioribus tomentosis, calycis glabriusculi laminis antherisque brevissime apiculatis, stigmate fusiformi inarticulato, nucula obovata compressa margine breviter apice longe comosa.—*Drummond*, coll. vi. n. 168.—Species *Petrophilam* inter et *Isopogonem* ambigua, stigmate cum priore, fructu cum posteriore magis conveniens, facie accedens ad *P. striatam* et *ceratophyllum*, sed notis indicatis ab utraque bene distincta.
8. *Petrophila plumosa*, Nob.; ramis incano-tomentosis, novellis cum foliis suis patulo-sericeo-pilosis, foliis spathulatis minute puberulis, infimis passimque summis indivisis, reliquis apice dilatato complicato trilobis penninerviis, lobis vix divergentibus acutis, capitulo terminali globoso foliis superato, squamis liberis acutis sericeis mox glabratiss, intimis setaceis plumosis, calyce luteo-villoso sericeo, stigmate fusiformi inarticulato, samara obovata truncata basi breve comosa.—*Drummond*, coll. vi. n. 164.

A very distinct species, the leaves somewhat resembling those of *P. biloba* and *propinqua*, but much larger, 1-1½ inch long.

9. *Isopogon adenanthoides*, Nob.; ramulis incanis, foliis tereti-filiformibus ultra medium trifidis, lobis indivisis exsulcis mucronatis ramisque patulo-pilosis, capitulo terminali parvo, squamis sericeo-lanatis albis, calyce glabro, laminis apice breve pilosiusculis, stigmatibus articulo superiore tenui subulato glabro, inferiore anguste clavato tomentello, nucula undique longe comosa. — *Drummond*, coll. vi. n. 171.

In habit extremely like *Adenanthos sericea*, and also more resembling *Petrophila Serruriæ* than any species of *Isopogon*, yet certainly belonging to the latter genus on account of the stigma and fruit. The leaves are from 7 to 10 lines long.

10. *Isopogon linearis*, Nob.; ramis incanis, foliis sessilibus linearibus

integerrimis planis mucronulatis basi attenuatis 1-nerviis penniveniis minute puberulis, capitulo terminali globoso foliis superato, squamis acutis cano-puberulis, calyce glabro, antheris apiculatis, stigmatibus articulo superiore conico-subulato, inferiore obconico tomentello, nucula . . .—*Drummond*, coll. vi. n. 169.

Allied to *I. sphærocephalus*, but differing in the leaves being smaller ($1\frac{1}{2}$ – $2\frac{1}{2}$ inches long, 1–2 lines broad), the calyx quite glabrous, the joints of the stigma of equal length, and the inferior one thinner.

11. *Isopogon trilobus*, R. Br. ? *β. tridens*, Nob. ; ramulis apice tomentellis, foliis petiolatis cuneato-oblongis planis apice 3-fidis v. 3-dentatis rugoso-striatis glabris, lobis late triangularibus pungenti-mucronatis, lateralibus divergentibus, capitulo terminali globoso, squamis acuminatis albo-sericeis, floribus . . . , nucula undique longe comosa.—*Drummond*, coll. vi. n. 170.

Perhaps a distinct species (as Mr. Drummond considers it, Hook. Journ. 1853, p. 178), but our specimen affords no sufficiently distinctive characters. It certainly differs from what I formerly (Pl. Preiss. i. p. 507) took to be *I. trilobus*, which I now refer to *I. tripartitus*, R. Br.

12. *Stirlingia capillifolia*, Nob. ; glabra, caule brevi, ramis gracilibus basi lignosa conferte foliosis supra aphyllis, ramulis elongato-filiformibus simplicissimis 1-cephalis, foliis flaccidis extra medium quater v. ultra dichotomis, laciniis tenuibus exsulcis muticis, capitulis globosis, bracteis lineari-subulatis calycis tubo brevioribus, limbo obtuso dimidium tubum æquante.—*Drummond*, coll. vi. n. 173.

The leaves are almost like those of *S. simplex*, *anethifolia*, and *tenuifolia*, but our species differs from these either in the branched habit or in the solitary flower-heads.

13. *Conospermum ephedroides*, Kippist in litt. ; fruticosum a basi ramosum, ramis longis cano-sericeis subaphyllis, foliis raris bractæformibus e basi lata amplexicauli triangularibus mucronatis, capitulis prope apicem ramorum alternis sessilibus, rhachi canescente demum paullo elongata, bracteis late ovatis acuminatis glabriusculis ciliatis flore glabro paullo brevioribus.—Prope Yeneri.—*Gilbert*, n. 71.

A very distinct species, approaching somewhat in habit to *C. bracteosum*. From some remains left the radical leaves appear to be long and filiform. I have not seen this plant.

14. *Conospermum debile*, Kippist in litt. ; decumbens, foliis radicalibus petiolatis spathulatis planis 1-nerviis subaveniis, caulinis brevioribus

remotis linearibus dorso convexis, omnibus cono sphacelato terminatis, paniculæ laxæ ramis adscendentibus racemoso-corymbosis, ultimis subsericeis imbricato-bracteatis, bracteis deciduis, capitulis paucifloris, rhachi villosa, floribus glabriusculis (cæruleis) bracteas coloratas cordatas acuminatas duplo superantibus.—*Gilbert*, n. 164.

Allied to *C. polycephalum*, but of weaker growth, with shorter leaves (radical ones three inches, upper ones about one inch long), and almost naked bracteæ. I have not seen it.

15. *Conospermum acerosum*, Lindl.—Meisn. in Pl. Preiss. i. p. 522.—*Drummond*, coll. vi. n. 174.

16. *Conospermum nervosum*, Nob.; ramis puberulis dense foliosis, foliis brevissime petiolatis rigidis glabris oblongis ovalibusve obtusiusculis v. subretusis (cum mucronulo deciduo) prominulo-trinerviis subreticulato-venosis, nervis lateralibus margini approximatis, corymbi parvi capitulis dense multifloris, pedunculis folia subæquantibus, bracteis adpressis ovatis acuminatis, calycis tubo angusto glabro dimidium limbum æquante, limbo puberulo ultra medium bilabiato, lobis obtusiusculis, stigmate incurvo truncato-cucullato, ovario sericeo apice flavo-comoso.—*Drummond*, coll. vi. n. 175.

There are two forms under this number which, though at first sight appearing to differ, are perfectly alike in the flowers and the nerves of the leaves, and evidently pass into one another in the shape of the leaves. Allied to *C. ellipticum* and *marginatum*.

a. *ovalifolium*; caule simplici, foliis infimis oblongo-lanceolatis basi longiuscule attenuatis ($2\frac{1}{2}$ poll. longis, 7–8 lin. latis) reliquis ovalibus v. ovato- v. oblongo-ovalibus obtusis utrinque vix attenuatis (1 poll. longis, 2–3 lin. latis).

β. *subspathulatum*; caule subcorymboso-ramoso, foliis spathulato-lanceolatis linearibusve (circ. pollicaribus 2–3 lin. latis) passim ovali-oblongis.

17. *Persoonia* (Sacculigera) *comata*, Nob.; foliis spathulatis planis rigidis mucronulatis utrinque dense sulcatis glabris, racemis terminalibus et cæterum axillis simplicibus folio longioribus coma foliorum terminatis cæterum aphyllis undique cano-tomentellis, bracteis linearibus ciliatis pedicello dimidio brevioribus, calyce supra basin valde saccato apice subincurvo acuto, antheris sepala demum libera subæquantibus obtuse apiculatis, pistillo glabro, stylo brevi crasso recurvo, stigmate papilloso-hispidulo.—*Drummond*, coll. vi. n. 178.

A fine species, with yellow flowers and quite different leaves from all the *Sacculigera*.

18. *Persoonia* (*Sacculigera*) *Saundersiana*, Kipp. in litt.; ramulis cano-pubescentibus, foliis complanato-filiformibus rigidis utrinque 2-4-sulcatis (nervis 3 valde prominentibus) apice acuto recto sphacelato mucronatis pilosiusculis demum glabris punctis micantibus scaberulis, pedunculis axillaribus solitariis 1-floris adpresse hirtis flore subbrevioribus bractea ipsis brevior subulata v. rarius folio longo suffultis, calyce saccato extus glabriusculo intus basi velutino, sepalis apice breve cornutis, antheris obtuse apiculatis, ovario glabriusculo, stylo brevi crasso recurvo, stigmate obtuso.—*Drummond*, coll. v. Suppl. n. 4.

Very near *P. Fraseri*, which however has the leaves but half as long and less acute, the ovary pedicellate and villose, etc. I have not seen this species.

19. *Persoonia rufiflora*, Nob.; ramis canescenti-puberulis, novellis fulvo-sericeis, foliis sessilibus lanceolato-linearibus obtusis mucronulatis utrinque lævibus glabris prominulo-1-nerviis supra nervo margini proximo trinerviis, floribus axillaribus solitariis sessilibus dense rufo-villosis sericeis, calyce recto acuto apice vix attenuato, antheris sepalo dimidio brevioribus capitato-apiculatis, pistillo glabro, ovario brevissime stipitato cernuo ovato, stylo filiformi, stigmate truncato.—*Drummond*, coll. vi. n. 176.

This agrees in the shape and size of the leaves, in the inflorescence, and the pubescence of the calyx with *P. trinervis*; but differs in the nerves of the leaves, the more slender calyx, the stipitate and glabrous ovary, etc.

20. *Persoonia scabrella*, Nob.; ramis dense foliosis apice incano-tomentellis, foliis sessilibus erectis rigidis tereti-subulatis rectis obtusis minute mucronulatis basi vix attenuatis subtus 1-sulcis puncticulato-scabriusculis glabris, floribus axillaribus solitariis sessilibus, calyce angusto acutiusculo rufo-hirsutulo, antheris sepalo $\frac{1}{3}$ brevioribus capitato-apiculatis, pistillo glabro, ovario cernuo breve stipitato, stylo laterali filiformi basi torto apice subincrassato, stigmate truncato.—*Drummond*, coll. vi. n. 177.

Allied to *P. curvifolia*, but distinct in having the leaves more crowded, straight, not canaliculate, and less scabrous, etc.

21. *Persoonia striolata*, Nob.; ramulis cano-pubescentibus, foliis tortis

lineari-lanceolatis sphacelato-mucronatis infra attenuatis utrinque 6-sulcatis puncticulato-scabriusculis, junioribus adpresse hirtis, pedunculis axillaribus solitariis erectis florem subæquantibus, sepalis acuminatis extus puberulis intus glabris, antheris obtuse apiculatis, pistillo . . .—*Drummond*, coll. v. Suppl. n. 6.

Very near *P. striata*, which, however, seems to differ in having recurved peduncles and glabrous flowers. Leaves 1–1½ inch long; ½–1 lin. broad.

22. *Persoonia Mitchellii*, Nob.; ramis laxe foliosis, foliis patentibus rigidulis lanceolatis acutis basi attenuatis 1-nerviis obsolete venosis scabriusculis ramulisque tomentoso-puberulis, floralibus abbreviatis flores vix superantibus v. abortivis, pedicellis axillaribus cum calyce ipsis dimidio longiore sericeo-tomentosis racemos axillares et terminales breves apice foliosos formantibus, sepalis attenuato-acutis antherisque muticis, ovario cum styli basi villosa.—Nova Holl. orientali-austral.—*Sir T. Mitchell's Exped. of 1836 (Herb. Lindl.)*.

It resembles somewhat *P. articulata* in the leaves, which are 1–1½ inch long, 3–4 lin. broad, but differs in the pubescence, especially of the ovary. Racemes ½–1 inch long; their upper leaves 4–6 lin., the lower ones 1–2 lin., and the calyx 4–5 lin. long.

23. *Persoonia apiculata*, Nob.; ramulis dense foliosis minute puberulis, foliis patentibus vix rigidulis linearibus attenuato-acuminatis subarcuatis planis subnerviis lævibus glabris, floralibus conformibus, pedicellis axillaribus patulis cum calyce paullo longiore nutante glabris, sepalis subulato-acuminatis, antheris muticis, pistillo glabro.—Port Jackson.—*P. nutans*, A. Cunningham! MSS. (non R. Br.)

Though very closely approaching *P. nutans*, R. Br., it certainly differs from it in having the leaves more acuminate, the pedicels shorter than the calyx (3 lin. long), and the sepals terminating in a whitish, subulate point 1 line long (as in *P. acerosa*), which at last becomes spreading.

24. *Grevillea (Anadenia) rudis*, Nob.; foliis rigidis cuneato-spathulatis penninerviis subtus nervoso-marginatis punctato-scabris supra lævibus apice trifidis, inferioribus passim summisque lanceolatis integerimis, lobis oblongo-triangularibus pungenti-mucronatis, junioribus ramisque patenti-pilosiusculis, racemis terminalibus simplicibus ramosisve, pedunculo elongato remote bracteato, pedicellis capillaribus calycem rectum puberulum æquantibus, ovario hirsuto, stylo glabro

apice clavato, stigmatе conico, capsula viscido-pubescente.—*Drummond*, coll. vi. n. 180.

Very much like *G. manglesioides* in the leaves, but quite different in the stigma, which is exactly like that of *A. tenuiflora*, Lindl., and the style, almost shaped as in *Manglesia*; nevertheless the species certainly belongs to *Anadenia*.

25. *Grevillea* (*Anadenia*?) *triloba*, Nob.; ramis tomentosis, foliis rigidis semitrifidis supra plano-convexis lævibus glabris penninerviis subtus cano-puberulis marginibus fere ad costam usque acute refractis, laciniis divaricatis subæquilongis lanceolato-linearibus pungentiacutis, racemis (defloratis) ramulos breves terminantibus sessilibus brevibus cano-pubescentibus.—*Drummond*, coll. vi. n. 187.

Although the flowers of this species are unknown, I place this species in *Anadenia*, on account of its resemblance in foliage with *G. ramosissima*, Nob. (*A. Caleyi*, R. Br.). The style and capsules are almost as in *Manglesia glabrata* (fide Kippist in litt.).

26. *Grevillea* (*Conogyne*) *intricata*, Nob.; foliis rigidis tereti-filiformibus triternatis obsolete 1-sulcis ramisque glabris, segmentis divaricatis laciniisque subæqualibus mucronatis, pedunculo foliis longiore oppositifolio parce ramoso, racemis (2-3) patulis, pedicellis demum deflexis, floribus . . . , stigmatе conico brevi, capsula brevissime stipitata ovali ventricosa verruculosa glabra.—*Drummond*, col. vi. n. 189.

Resembling very much *G. paniculata*, but easily distinguished by the filiform (not linear) segments of the leaves, the peduncles 5-8 inches long, the capsule, etc.

27. *Grevillea* (*Conogyne*) *biformis*, Nob. in Pl. Preiss. 2. p. 258*.—*Drummond*, coll. vi. n. 181.

28. *Grevillea* (*Manglesia*) *erinacea*, Nob.; ramis incano-tomentellis, ramulis brevibus dense foliosis, foliis rigidissimis teretibus bternatis pungentibus glabris, laciniis subtus bisulcis lacinulisque semipatentibus, racemis axillaribus terminalibusque folia subæquantibus simplicibus v. basi ramulo brevi auctis densifloris, rhachi subsericeo-cana, pedicellis calyce parvulo adpresse pilosiusculo subduplo longioribus fructiferis recurvis, pistillo glaberrimo, stigmatе conico, capsula ventricosa lævi.—*Drummond*, coll. vi. n. 186.

In habit this is not unlike *G. crithmifolia* and *Hakea erinacea*, *lisso-carpha*, and *teretifolia*, but the pistil is exactly that of a true *Manglesia*.

29. *Grevillea* (*Manglesia*?) *acrobotrya*, Nob.; ramis incano-tomentosis,

floralibus elongatis apice subaphyllis, foliis rigidis cuneato-obovatis penninerviis (quasi bis triplinerviis) subtus subsericeo-incanis, marginibus anguste revolutis, inferioribus apice inciso 5-7-dentatis, summis diminutis semitrifidis, dentibus pungenti-mucronatis, racemo terminali solitario v. geminato erecto sparse folioso brevi-ramoso, pedicellis calyce brevi recto glabro dimidio longioribus, pistillo glabro, stylo crassiusculo recto (haud strumoso), stigmatе conico-cylindraceo.—*Drummond*, coll. vi. n. 185.

This has some resemblance in habit and foliage with *G. cuneata* (*Manglesia glabrata*, *Lindl.*), but differs from that subgenus in the shape of the style, which approaches that of *Conogyne*.

30. *Grevillea* (*Lissostylis*) *argyrophylla*, Nob.; ramulis apice angulatis subsericeo-tomentellis, foliis rigidis cuneato-oblongis apice bilobis penninerviis, lobis obtusis muticis, sinu angusto mucronulato, supra glabriusculis lævibus, subtus albido-sericeis, marginibus angustissime recurvis, racemis axillaribus terminalibusque capituliformibus folio brevioribus, pedicellis calyce parvulo incurvo sericeo demum glabriusculo brevioribus, pistillo glaberrimo calycem subduplo superante, stigmatе terminali oblique truncato.—*Drummond*, coll. vi. n. 179.

Allied to *G. diffusa*, Sieb., and *G. obtusifolia*, Nob., but quite distinct in the leaves, which, however, if another (flowerless) specimen sent under the same number really belong to the same species, seem to be linear, entire, and acute in the young plant.

31. *Grevillea*? (*Plagiopoda*) *cynanchicarpa*, Nob.; ramis strictis apice cano-puberulis, foliis crassiusculis linearibus acutis planis lævibus 1-nerviis subaveniis, pedicellis axillaribus solitariis 1-floris brevibus tomentellis, calyce deciduo (basi hinc ovarii villosi stipiti adnato), stylo mediocri recto crasso puberulo deciduo, stigmatе laterali suborbiculari plano obtuse umbonato dorso convexo, folliculo lanceolato-oblongo (bipollicari) utrinque attenuato obtusiusculo lignoso glabro sulcato 5-6-costato 1-valvi (1-spermo, semine apice alato, samarum *Frasini* imitante, fide *Drummond*, in Hook. Journ. 1853, p. 182).—On the Moore River and the great sand-plain north of Diamond Spring.—*Drummond*, coll. vi. n. 190.

This, as we have already mentioned above, is probably a new genus, for which we would propose the name of *Fitchia*,* in honour to the well-

* Dr. Hooker has already dedicated a Composite plant to Mr. Fitch. See Lond. Journ. of Bot. vol. iv. p. 640, t. 23, 24.—Ed.

known artist, whose numerous drawings in many of the best botanical works of England, are not less admirable for scientific accuracy, than for artistic skill and elegance. The solitary axillary flowers approach this curious plant much more to *Persoonia* and some *Hakeas*, and chiefly to *Strangæa*, than to any *Grevillea*, with which genus, however, it agrees in the stigma and hypogynous gland, and moreover the base of the calyx appears to be quite as in the section *Plagiopoda*. Unfortunately our specimens have all open and emptied follicles, and we are therefore unable to ascertain those characters on which the genus must essentially depend. It is a spreading shrub, 3-4 feet high. The leaves are 3-6, and the fruits 1-2 inches long, the latter rugulose, and with five or six deep furrows, separated by blunt longitudinal ribs. The pistil is 8-9 lines long, and the ovary shorter than its stalk, which adheres the whole length to the base of the deciduous calyx.

32. *Grevillea* (*Calothyrsus*) *insignis*, Kippist in litt.; glauco-pruinosa, ramulis teretibus glaberrimis, foliis elliptico-oblongis remote sinuato-dentatis marginatis nervosis glabris basi truncatis, dentibus spinosis, racemis terminalibus subramosis breve pedunculatis apicifloris, calyce glabro, stylo vix exserto complanato basi ovarioque villosa, stigmatate laterali orbiculari.—*Drummond*, coll. v. Suppl. n. 12.

Leaves almost like those of the common Holly, but glaucous, 2-3 inches long. Flowers fine, purple, the limbus recurved, villous inside towards the base. Hypogynous gland obsolete.

33. *Grevillea* (*Calothyrsus*) *Pinaster*, Nob.; ramulis teretibus, novellis fulvo-sericeis, foliis filiformi-linearibus integerrimis mucronulatis glabris vix rigidis subtus bisuleis marginibus arcte revolutis, racemis lateralibus simplicibus patulis basifloris, calyce inflexo pedicello longiore extus pistilloque glabro intus puberulo, stylo calycem duplo superante, stigmatate oblique truncato.—*Drummond*, coll. vi. n. 182.—Affinis *G. Lemniana*, sed distincta foliis angustioribus minus rigidis, marginibus revolutis obtusis (nec acute refractis), floribus glabris, etc.

I take this opportunity of observing that the plant I formerly took for *G. concinna*, R. Br. (Pl. Preiss. i. p. 545), is essentially distinct from that species, having the margins of the leaves acutely refracted, etc., and forms a new species, *G. coccinea*, Nob.

34. *Grevillea* (*Calothyrsus*?) *leucopteris*, Nob.; tota cano-tomentosa, foliis petiolatis vix rigidulis pinnatis, laciniiis anguste linearibus clon-

gatis planis mucronatis subtus bisulcis marginibus anguste revolutis, petiolo tereti, floribus . . .—*Drummond*, coll. vi. n. 183.

Allied to *G. eriostachya*, *chrysodendron*, and *Dryandri*, but certainly distinct. Our specimen is without flower or fruit, but Mr. Kippist has seen in the herbarium of Sir W. Hooker, and under the same number of Drummond's collection, a fine panicle of flowers, and a cluster of fruits, of which he has kindly sent us the following description: "panicula terminali, racemis dense multifloris, calycis tubo glabro intus basi villosa, limbo . . ., pistillo longe stipitato glaberrimo, stigmate laterali obovato marginato antice convexo, folliculo ovali ventricosso styli basi mucronato (9 lin. longo, 6 lin. lato), seminibus . . ."—We have however excluded these notes from our diagnosis, being not quite certain of the flowers, fruit, and leaves belonging to the same plant, as the specimens are separated from each other. To judge from the habit and fruit, this and perhaps also the following species may possibly belong to the subgenus *Cycloptera*. The leaves are 8–10, their lobes 3–7 inches long.

35. *Grevillea* (*Calothyrsus*? *Cycloptera*?) *thyrsoidea*, Nob.; ramis albidis tomentosis, foliis rigidis pinnatis glabris, laciniis 8–14-jugis anguste linearibus mucronatis utrinque punctato-scabriusculis subtus bisulcis marginibus acute refractis, lobo terminali proximis subtriplo brevior, panicula terminali thyrsoidea longe pedunculata, racemis elongatis basifloris, calyce incurvo pubescente, ovario villosa, stylo longe exserto (pollicari) pilosiusculo, stigmate terminali oblique truncato subrotundo.—Common between Dundagaran and Smith River.—*Drummond*, coll. vi. n. 183.

A fine and very distinct species, allied to *G. Dryandri*. It is said to be a prostrate shrub (*Drummond*, in *Hook. Journ.* 1853, p. 178). The leaves are 3–4 inches, their lobes 1–1½ inch long, and scarcely more than half a line in breadth; the peduncles a foot and more high, bearing remote foliaceous lanceolate bracts; the calyx 3 lin. long, rose-coloured.

36. *Grevillea* (*Calothyrsus*) *Mitchellii*, Nob. (non Hook.); foliis rigidis elongato-linearibus pinnatis passim indivisis ramisque cano-tomentosis, lobis obtusis submucronulatis lævibus subtus bisulcis marginibus arcte revolutis obtusis, racemis axillaribus terminalibusque subsessilibus erectis folio longioribus subsecundis densifloris, calyce pilosiusculo inflato basi obliquo, laminis apiculatis, pistillo calycem dimidio

superante (subpollicari), ovario sessili villosa, stigmatè laterali ovali obtuso.—Subtropical East New Holland, *Sir T. Mitchell*.—*G. Mitchellii*, Lemann! MSS. in herb., nec Hook.

Though very near *G. chrysodendron*, R. Br. (*G. Mitchellii*, Hook.), it is certainly distinct from this in the pubescence, which is not silky, in the more rigid leaves, the larger and ventricose calyx, the shape of the stigma, etc.; nor does it agree with *G. Sturtii*, which we have not seen.

37. *Grevillea (Calothyrsus) Hookeriana*, Meisn. in Pl. Preiss. i. p. 546.
—*Drummond*, coll. vi. n. 184.

(To be continued.)

Extracts of Letters from the Malayan Islands, addressed to Sir W. J. Hooker and to W. Mitten, Esq.; by JAMES MOTLEY, Esq.

(Continued from p. 47.)

TO W. MITTEN, ESQ.

Batavia, Oct. 9, 1854.

You will, I suppose, be surprised to receive a letter dated from this place; but I have now entered into an arrangement with a Dutch Company, established here to work the mines of Netherlands' India. We commence operations on a concession granted by Government to the Company, of nearly 500 square miles of coal-measures at Bansjarmassin, which you will find nearly at the south point of Borneo, and thither I now go as soon as a ship is procured. It is, I believe, a very fine country, and will doubtless yield me some plants: the trip will of course delay very much my at present projected collection, but will certainly enable me to make it more interesting by giving the north and south range of many Grasses, over about ten degrees of latitude. I of course must not now restrict it to Singapore; say, "collected in the Indian Archipelago." I have got about thirty sets, of perhaps sixty species each, already, and there are two or three common ones which I can pick up any day to add to the list. This is my second visit to Java; I came down at first about three months ago to arrange all this matter, and I then returned to Singapore for my family; we landed here this morning. We are in capital quarters, in the house of a Dr. Burger, who is one of the Directors of the Company; he was formerly for many years attached

to the Government Natural History staff, and was with Van Siebold for a long time in Japan, of which his reminiscences are very interesting: he is a botanist too as well as a zoologist, so we get on famously. When here before, having to remain six weeks, I took the opportunity of going up to the mountains. I first spent several days at the Botanic Garden at Buitenzorg: the sub-curator, Mr. Bennendyk, is a good botanist, and was very kind indeed, in showing me everything. I had the opportunity of seeing the new *Rafflesia* (*Brugmansia*) *Zippelii* in spirits, and of examining fresh fruit of *Azolla* and *Salvinia*, and of studying a noble collection of Orchids and Palms; of the latter the collection is very numerous; but though I knew sixty at Labuan, I only recognized about a dozen of them here. How many Palms exist in these wonderful countries, who shall say? After seeing the garden, I made a trip into the mountains, remaining nearly a week at Ivegoe, about 4000 feet above the sea. I think, had you been with me, you would have almost gone crazy, as I did, at the Cryptogams: every tree, from leaf to branch, was covered with Mosses, Hepaticæ, and Lichens, to say nothing of Orchids and Ferns; no words can express the beauty of the jungle. The most productive places, however, I found to be the old coffee-plantations, where the scrubby crooked trees were almost borne to the ground by the weight of parasites: here a great epiphytal *Ficus* or *Fagraea* mounted on high, far thicker and stronger than its supporter; and there a perfect blaze of scarlet *Æschynanthus*, streaming down from the huge matted tufts of *Asplenium* or *Acrostichum*, ship-loads of *Vanda speciosa* and odoratissima, *Saccolabia*, *Dendrobia*, *Ephippia*, any one of which would have carried off all the prizes at Chiswick, and sent all the gardeners into fits; and in every damp hollow, groves of *Dicksonias*, *Alsophilæ*, and *Marattiæ*, some rising forty or fifty feet, whose marvellous elegance and beauty, when swept by the wind, neither pen nor pencil can tell. *Aroidæ* are in great force, and of very various forms, as are also parasitical *Rhododendra*, *Thibaudia*, and such plants. *Melastomaceæ* are very prevalent here, especially the genus *Medinilla*: most of them are semi-parasitic trailing plants, and hang in great masses from the trunks of the trees. But the Mosses and *Hepaticæ* enticed me most, for these I could collect; while it was impossible, in my hurried trip, to dry other plants. Some of the pendent *Hepaticæ* and *Neckeræ* are a foot or more long, and the effect of large masses of them is most beautiful, especially intermixed as they are with long bunches of a

white *Usnea*, like *U. florida*. I believe I have collected about 200 species of *Hepaticæ*, *Musci*, and *Lichens*, and the greater part of them in fruit. I shall be able, I think, to make twenty to thirty sets when I have time to open them; at present I have just dried and packed them up in a box, which it will be several months before I am able to attack: you shall receive some early specimens when I do get at them. The natives here are very capital, intelligent fellows; I had three of them with me each day, with baskets, for which I paid one rupee, or about sixteen pence, and they seemed quite delighted; they soon found out what I wanted, and I owe many of the specimens in fruit to their sharp eyes. When I found a species barren, I just showed it them, and told them where I expected to find the fruit proceeding from, and they rarely failed to find it before long; they seemed, too, to identify themselves so with the matter, and showed such emulation as to who should be the first to find something new, that it was quite pleasant to be with them,—I might have fancied myself among botanists; these mountaineers, however, are botanists to an extent you would hardly expect among so-called savages. Every plant has its native name, and given upon the system of generic and specific names: for instance, when I asked a man the name of a little *Pavetta*, he said at once, “I never saw this before, and I don’t know its own name, but its ‘mother name’ is so and so,” mentioning the native generic term for *Pavetta Iwora* and such plants in general. The authors of the catalogue of the Buitenzorg Garden have thought these names worth recording, and I think they are right; for I saw many plants I should not have seen, especially among the *Ericææ*, but by asking for them by such names given in the catalogue; and it is wonderful, on looking these over, to find how well the system is carried out. It is of course imperfect, but remarkable for people with no written language;—they do not speak Malay or Javanese, but a peculiar dialect called Sundanese. When I was tired of Ivegoc, or rather when I had spent as much time as I could afford there, I went on about twenty miles further to Chepanas, where there is a regular European garden, to supply vegetables for the Governor’s table. It was pleasant enough to see there beet and lettuces, etc., growing very finely. There is a pond also with some *Salix Babylonica*, but they look miserably, as do the European fruit-trees, though they seem to grow pretty quickly. The Plums appear to have most of the true flavour. The Apples certainly attain the most perfect colour; and the

Peaches, though they have a pretty good appearance, are said to be quite tasteless; the fact is, the trees get no rest, so as to ripen any true bearing-wood. The Apples grow with long and ever-lengthening shoots, more like Osiers than their brethren in Europe. At this place, which is in the midst of the plateau of the Preangu district, about 4000 feet above the sea, you have quite an Italian climate, and it is cold enough at night to make a blanket pleasant. It takes its name, Chepanas, or "hot river," from a warm spring close to the Governor's house, where there is a convenient bath, very pleasant after a hard day's walking. There is a small botanic garden here also, where they have a good many Japanese plants; but the most remarkable objects are two splendid specimens of the Norfolk Island *Araucaria*, perhaps sixty feet high, young trees, but in a state of health and vigour which promises well for the future.

From Chepanas I made my last and crowning trip to the top of the Pangerongo Mountain, about 10,500 feet. I cannot pretend to tell you all the plants I saw; but you, who have never experienced the sensation, cannot imagine how odd it was, all at once to get again among forms such as two species of *Viola*, three *Ranunculi*, three *Impatiens*, *Primula*, *Hypericum*, *Swertia*, *Convallaria*, *Vaccinium*, *Rhododendron*, *Gnaphalium*, *Polygonum*, *Digitalis* (?), *Lonicera*, *Plantago*, *Artemisia*, *Lobelia*, *Oxalis*, *Quercus*, *Taxus*, and about a dozen species of *Rubus*, all beautiful plants. *Prinula imperialis* only grows near the summit; it is a charming species, the leaves like *P. vulgaris*, with an interrupted verticillate spike, sometimes three feet high, of golden flowers. *Hypericum Javanicum* is also a fine plant, with the shrubby habit of *H. hircinum*, but large solitary flowers like *H. calycinum*. *Gnaphalium Javanicum* is a woody shrub, about six feet high, very ornamental. Up among these plants, amid the Moss which hangs to the trees in masses as big as a man's body, are two fine parasitical Orchids, a *Dendrobium* with bright purple flowers, *D. purpureum*, and a little pseudobulbous plant with large flowers like a *Cymbidium*; and yet these plants, often exposed to 36–38° Fahr., we should perhaps put at home into an orchideous stove at 85°, and then be surprised when they died. I was much astonished at the distribution of plants of this tribe. I have often been puzzled why I did not get more species at Labuan and in other steamy hot places down at the sea-level, where, I believe, most English botanists would hope to find them; whereas at about 4000 feet, with a night

temperature of 45° to 50° , every tree is laden with them. Surely we are in the habit of *coddling* them (to use a Yorkshire word) too much in our stoves; and when it is considered that a change of plan would bring these lovely and curious plants within reach of many zealous cultivators who cannot now afford the expense, it would surely be worth some nurseryman's while to try the experiment on a large scale of cooler houses for orchids.

I remained one night on the top of the mountain. It was exceedingly cold. I had forgotten to bring up a thermometer, but water was frozen in a plate raised a couple of feet from the ground. There are plenty of excellent strawberries here; they have of course been planted, but, so far as fruiting is concerned, seem quite at home. I did not however see one stolon thrown out. They grow with scaly stems, in tufts just like *Dryas octopetala*. We saw nothing the evening we got up, as all was enveloped in a wet searching mist, but in the morning I was amply repaid for my trouble. The summit of the mountain, evidently an extinct volcano, is a sort of amphitheatre about 500 yards in diameter, broken through on one side by a deep narrow ravine. This space has been cleared, and is chiefly covered with Strawberries; for the Apples and other European trees planted there are so covered with foliaceous lichens that they can hardly vegetate. The forest of crooked stunted shrubs, chiefly Ericaceous, extends to the very edge of this amphitheatre outside. At sunrise I climbed up to the ridge, and for half an hour had an uninterrupted view. I could see the sea to the north and south of the island of Java, and in the distance, to the south-east, chain upon chain of mountains, ending at the sea with the smoking summit of Janykuban-prahu, which has within a few years been very active. A heavy haze hung over Bulana, so that I could not see it; but nearer to me, on both sides, I looked over miles of cultivated country; the system of sawah, or wet rice cultivation, making the country look half lakes and rivers. Nearer to the north-west, within about thirty miles, rose the jagged peak of the Salac, one of the best botanical mountains in Java, now all green and still, though some seventy years ago it committed frightful havoc and destroyed many lives; and to the south, almost under my feet, gaped the white barren crater of the Gédé, another peak of the mountain on which I stood,—a slight smoke rising out of its unfathomable depths, to testify that, though slumbering, the fire-king was not dead. You cannot conceive anything

more sublime than the bare walls of lava and banks of white pumice furrowed by the rains into deep ravines, and the wreaths of blue smoke curling up in the sunrise, with the dark primeval forest creeping up in places to the very edge of the abyss, or with countless dead grey branches, silently attesting how different the scene may sometimes be. If you add to this the huge masses of boiling clouds rolling over the flanks of the mountain, now hanging at the very edge of the crater, and then sweeping rapidly down to the plains, the strange ashy aspect of the nearest trees covered with pale lichens, and the bright blue tropical cloudless sky and rising sun, you may perhaps imagine something of a scene which I can neither describe nor forget. I felt inclined to shout for joy, and I never even thought of the cold until I tried to sketch, and found my hands so numb I could not hold a pencil. I did manage to get, however, an outline of the water. Coming down again was harder work than climbing up, and played the very deuce with my knees; but nevertheless, when I met Bennendyk half-way up, I was glad enough to turn back with him. We took a short walk that afternoon, to see a thicket of *Rhododendron Javanicum* in flower. The plant is now, I believe, in Europe; and if it grows as it does here, it is almost the finest plant in the gardens: its beautiful flame-coloured blossoms are in large bunches of twenty or more, and the colour is more dazzling than that of any flower I know. I saw also two other *Rhododendra*, *R. rubriflorum*, a beautiful scarlet, and *R. album*, in perfection,—both very free flowerers, and very beautiful plants.

That night we remained in a small house on the mountains, and the next day went up another peak, and also to see some cataracts. Of these there were three falling at the head of a gorge, over a cliff some 150 feet high. There was a fine supply of water, but in time of rain it must be immense, judging from the quantity of stones and timber heaped below. The rocks are covered with *Bartramia fontana*, a white *Sphagnum*, and a deep-red Hepaticous plant, and with great patches of the broad leaves of *Gunnera*, and a dark-green Urticaceous plant, which seemed to rejoice in the spray and foam. Large bushes of *Acacia volcanica*, and a tall *Saccharum*, were scattered among damp stones covered with Mosses and *Hepaticæ*. I gathered a curious *Gyrophora* in fruit on a dead Fern trunk. The white *Sphagnum* I mentioned as abundant here I saw on the course of one stream only, which rose in a hot-water spring half-way up, where it was very abundant. Coming back I found

a curious plant, *Campanumœa Javanica*, a sort of climbing *Campanula*, with greenish flowers, veined like the Henbane, and black pulpy fruit; it is a pretty plant. The enormous size of the leaves of the undergrowth in these dells gives a most peculiar character. *Gunnera*, *Caladium*, and *Musa* occupy large spaces, and are eminently social plants. I had this day the pleasure of seeing a Rhizantheous plant alive; it is a species of *Balanophora*, and grows nearly underground on the root of a *Cissus*. The thallus, or whatever you may call it, is slightly branched, fleshy, and glutinous, and is sought by the natives, who dry and burn it for torches.* Coming down, I had the pleasure of assisting in making the first plantation of *Cinchona* in Java, consisting of several hundred plants, which Bennendyk had come to plant half-way up the mountain. They are of the *C. Calisaya*, known to produce the "*Yellow-bark*," the most precious of all the cinchonas.—J. M.

On two Fibres from Brazil; by THOMAS C. ARCHER, ESQ.; *with a Note by* SIR W. J. HOOKER.

"There has been imported, within the last few weeks, into Liverpool, from Bahia, two varieties of vegetable fibre which I believe are new to the commerce of this country. One of them is, commercially speaking, a species of flax, and is proposed to be used in the same way as that valuable material; it is in small hanks about twelve inches in length: the individual fibres are remarkably fine, and have a peculiar appearance, somewhat resembling a '*long-staple*' sheep's-wool. The colour is a pale green. This material was imported experimentally and was called '*Tecum*.' I do not remember to have seen it mentioned in any works on Brazil. Upon comparing it with a specimen in the 'Collection of Liverpool Imports,' I am led to imagine that it is the produce of a *Palm leaf*; the specimen I refer to was a fine fibre, but coarsely prepared, from the leaves of the Carnahuba or Carnauba Palm (*Corypha cerifera*). The price stated in the foreign invoice is equivalent to eighteen-pence per pound.

"The other article is a very coarse red fibre of considerable length,

* A European would as little expect such a property to exist in these plants as in our *Lathrea squamaria* or *Montropa Hypopitys*; yet of another Balanophorous plant, in New Granada, candles are made, of which samples are deposited in our Museum of Economic Botany at Kew.—ED.

resembling the Asta bark in Dr. Royle's collection of vegetable fibres; it is evidently, I think, the fibrous portion of the bark of some tree, probably an *Acacia*. This material was also sent from Bahia, and its application as a substitute for oakum was suggested; neither of these articles has yet met with purchasers. I send specimens of each for the Museum at Kew.—T. C. ARCHER."

In offering a few remarks upon the two fibres above mentioned, and kindly sent to us by our friend Mr. Archer, we must take the opportunity of alluding to the importance, in a mercantile and commercial point of view, of the establishment of Museums like that which is alluded to in the last paragraph, and like the commercial one now forming at Liverpool under Mr. Archer's care. Without the Museum at Kew, the origin of these fibres, and the uses to which they are applied in their native locality, might still and for centuries have remained unknown. But let it be observed, it is not merely as a deposit for the useful products of the vegetable kingdom that this has become of national importance; but to the encouragement that has hereby been given to educated travellers and scientific botanists, to direct attention to those subjects during their arduous voyages and journeys: and we would appeal to the good sense and judgment of the "merchant princes" of this country, whether it would not be *pecuniarily* well worth their while to contribute to the outfit and maintenance of competent persons, who now are engaged, or may yet be so, in exploring countries where a better knowledge of the products might lead to a discovery of new kinds, and a more intimate and correct acquaintance with the properties of all. Many parts of China, and even Japan, abounding in vegetable riches, known and unknown to science and the arts, are at length open to the enterprising traveller: and we know that Sir John Bowring, the talented Governor of Hongkong (through whose exertions the famous Rice-paper plant is clearly ascertained and introduced alive to Europe), will do everything in his power to facilitate the researches of a competent person. The gums, and resins, and drugs of Persia, and Arabia, and Abyssinia, have, in very few instances, been traced to the plants which yield them: and in the first of these countries we have a British minister at the Court, the Honourable Charles Augustus Murray, who is equally disposed to further the views of any enlightened traveller. There is at this time such a dearth of fibres for textile materials, and for paper in particular, as to have created a kind of textile panic in the country; and without any kind of knowledge of the natural properties of plants, all sorts of people,

save those competent to the task, are making paper of saw-dust and straw, and couch-grass,—in short, anything but of those substances to which science would direct its votary:—and hence so many failures.

But to return to our present subject. We owe our knowledge of the origin of fibres to which Mr. Archer has here directed our attention, mainly to the botanical and other qualifications of Mr. Spruce, who has now been engaged in exploring the vegetable riches of the Amazon and its tributaries for the last five years, with the greatest assiduity, and with the most remarkable success, as may be seen by his letters in the last five volumes of the present Journal. Mr. Archer, from great experience in textiles, judged the first of these fibres (which he aptly compares to “long-staple” sheep’s-wool) to be derived from the leaves of a Palm, having seen a somewhat similar, but coarser, in the collection of Liverpool imports, which was considered to be the *Carnauba*, *Corypha* (or *Copernicia*) *cerifera*, and he may be right. Mr. Spruce sends a similar material, in a coarser state (in that respect agreeing with that just mentioned by Mr. Archer), as “a cord of *Tucúm*, and bundles of raw fibre. This latter is merely the leaves of the young shoot (which before it bursts forth is quite colourless) of the *Tucúm Palm* (*Astrocaryum Tucum*, Mart.), torn up into shreds: it needs no cleaning process of any kind.” The cord is excellent, strong, and very beautiful. Of smaller twine from this fibre are made the hammocks which some travellers have called “*grass hammocks*.” No doubt from other Palms a very similar substance may be obtained, and probably the same name of “*Tucúm*,” or “*Tecum*,” given to it: as, even by more enlightened people, many kinds of fibres are called “*hemp*.”

The other article, “a coarse red fibre,” mentioned by Mr. Archer, and recommended as a substitute for *Oakum*: this we find is the produce of a noble tree, of which the seeds or nuts are well known in this country as the “*Brazil-nut*” (*Bertholletia excelsa* of Humboldt, who first accurately described the entire fruit), the *Castanheira* of the Brazilians. The bark (as in the specimens sent by Mr. Spruce, and as in those from Mr. Archer) is beaten into *Oakum*, and much used in that form for caulking ships at Pará. Mr. Archer has examined this *oakum* microscopically, and he kindly sends me a drawing,* which I trust he

* It gives me pleasure to be able to say that Mr. Archer is preparing a ‘Manual of Economic Botany,’ for which few men are more competent, and none in a better position for inspecting materials for such a work.

will publish, made under a quarter of an inch lens, the small detached cells having been separated by boiling in an alkaline solution. In this he finds curious fusiform bodies, cells (?), $\frac{1}{100}$ of an inch in length, apparently subdivided (transversely) by thick partitions, each compartment containing a small opaque nucleus. These would seem to break up into roundish or oblong or four-sided cells, well defined, filled with matter resembling cork, under a low power having a shining satiny lustre. This corky substance may render this fibre especially valuable for caulking.

There can be no doubt but the microscope will render great service in detecting the nature and several properties of fibres. Indeed, while examining the Brazil-nut fibre, Mr. Archer was led to submit to the microscope that of another useful fibrous bark, of the *Tauaré*, employed on the Amazon for making the envelopes of cigars. "The single tree," says Mr. Spruce, "I saw of this, was too large and too lofty to admit of procuring its leaves; but from its habit, smooth fissile bark, and trunk dilated into buttresses (called 'sapopemas'), I do not hesitate to consider it a *Lecythis*, though a different species from *L. ollaria*." Now, Mr. Archer observes, "Even without the information afforded by Mr. Spruce, I should have been led to suppose it was a species of the same family; the parenchyma in *Tauaré* is more stringy and firm, and the cork-cells are smaller and more compactly arranged. In other respects the structure is the same." It is well known that the two trees belong to the same natural family, the *Lecythideæ*. They are of a gigantic size: some of the Castanha-trees, we learn from Mr. Spruce, "in the forests of Tanau, are the very largest I have anywhere seen. I measured one, which was fourteen yards round at the base, and at the height of fifty feet the circumference was apparently very little less. It must have risen to above one hundred feet before putting forth a single branch."

BOTANICAL INFORMATION.

Information respecting the MORA TREE (Mora excelsa, Benth.) in Trinidad.

"Prominent among the trees which adorn the forests of Guiana, and which astonish by their profuse verdure and gigantic size, stands

the majestic *Mora*, the king of the forest. Rising to the height of from sixty to ninety feet before it gives out branches, it towers over the wall-like vegetation which skirts the banks of the rivers of Guiana, forming a crown of the most splendid foliage, overshadowing numerous minor trees and shrubs, and hung with Lianas in the form of festoons. The *Mora*, of all other trees of the forests of Guiana, is peculiarly adapted for naval architecture; and it is to be found in such abundance, that if once introduced for building material into the dockyards, there can never be any apprehension there would be a want of that timber which could not be supplied. The wood is uncommonly close-grained, and gives scarcely room for a nail when driven into it; when cleared of sap it is durable in any situation, whether in or out of the water. With this property it unites another of equal consideration to builders: it is strong, tough, and not liable to split, has never been known to be subject to dry-rot, and is considered therefore by the most competent judges to be superior to Oak and African Teak, and to vie in every respect with Indian Teak. The full-grown tree will furnish logs from thirty to forty, or even fifty feet in length, and from twelve to twenty-four inches square, taken from the main stem, whilst the remaining portions are suited to various purposes of naval architecture: such, for instance, as keels, keelsons, stern-posts, floors, ribs, beams, knees, breasts, backs, etc."

Thus wrote Sir Robert Schomburgk fifteen years ago (Transactions of the Linnæan Society, vol. xviii. p. 207): and, in the same volume, that there might be no difficulty of distinguishing the tree in the search for it in other countries, Mr. Bentham, from specimens sent by Sir Robert, published an excellent figure and botanical history, under the name of *Mora excelsa*: for it had previously no place in botanical works. It belongs to the Natural Order of *Leguminosæ*, and to the same group or section as the well known Cassias. Yet it does not appear that the attention of any of our authorities or travellers has been directed to the commercial importance of this tree, till very recently. The same tree has been found to prevail in certain localities of the island of Trinidad. We are enabled to give publicity to the following important particulars, by the kindness of the Right Honourable Sir George Grey, Chief Secretary for the Colonies, who received the following letter from Governor Elliot, dated:—

"Government House, Trinidad, Sept. 9, 1854.

"By this mail I have had the honour to forward to Sir James Graham, two specimens of *Mora* timber, taken from the fringe of a

vast forest cropping out of the shore of the Gulf of Paria, about five miles to the southward and westward of the mouth of the Irois River.

"One of my earliest objects after my arrival here was to procure reliable information on this material point, of the accessibility of the great *Mora* forests, from the western or protected shores of this Island, because, speaking as a professional man, I know the almost insuperable difficulty of carrying on an extensive timber traffic from the eastern shores of Trinidad, without safe anchorage along its whole length, exposed to strong trade-winds and a considerable sea for at least nine months of the year, and to very uncertain weather for the remainder.

"Having learnt that the *Mora* forest abutted, or nearly so, on the Gulf shores of the Island, where the water is always as smooth as in a river, I sent Mr. Purdie, the Superintendent of the Botanical Garden, to the point which I desired most to examine.

"It will be seen by the accompanying memorandum, that he has ascertained that the forest comes close up to the sea-beach, near the mouth of the River Irois."

Mr. Purdie's Report to the Governor.

"In pursuance of your Excellency's instructions to ascertain and report on the extent and facility of access to the vast forests of *Mora* (*Mora excelsa*) known to exist in this Island, extending from Cedros to the valley of the Ortoise, and comprising an uninterrupted belt of forest of this valuable timber of more than sixty miles long, I have the honour to report that the banks of the Oropouche River, debouching on the east coast, are also covered with dense and extensive forests of *Mora*, but they are only accessible a little to the northward of Manzanilla Point, where this river finds its way into the sea. Little, however, is known of this river, and anchorage off its mouth, on the eastern or exposed shores of the Island, cannot be depended upon.

"I have for a long time known of the existence of immense forests of *Mora* in this Island, having traversed them in various places in the most remote and least frequented parts of the country, and I had the honour to direct the attention of our late respected Governor, Lord Harris, to the existence of this vast source of wealth; but the great obstacle has always been the difficulty, or supposed difficulty, of approaching the eastern or southern coasts of this Island at all seasons of the year; consequently, the discovery of easy access to these forests

from the Gulf side of the Island (the waters of which are always tranquil) has been justly considered by your Excellency as a great desideratum.

"I am happy to say, that I am now able to lay before your Excellency the most cheering prospects of opening these valuable forests from the Gulf, or protected side of the Island.

"The forests of *Mora* advance towards and recede from the coast of the Gulf of Paria in various places between Point La Brea and Cedros, at the Rivers Guapo and Irois, which are both navigable for some distance. These forests recede some three miles from the coast; but about four miles below (to the south) the River Irois, there is another tide-serving river, extending some miles into the interior. This is called Rio de Clu, and at this point the *Mora* forests come up to the sea-beach. The river has a good entrance: its banks are perfectly level, and composed of a hard, white, sandy soil, poor in itself, but clothed with a forest such as is rarely seen in any country in point of abundance, size, and quality of its timber.

"The great peculiarity of a forest of *Mora* is, that it is a gregarious tree, that is, it excludes every other kind of tree, or in other words monopolizes the entire soil to itself, like a forest of Pines or Fir-trees in northern climates; and this is of immense advantage, because every tree is available that is of sufficient size, which is not the case with any other timber tree that we have: for example, *Poni*, *Baltata*, *Cedar*, *Sipre*, and others,—all excellent timber, but they always occur more or less isolated, and require the constant removal of the saw-mill, etc.; while in a forest of *Mora*, once plant the saw-mill, and you have work for years, however energetically it may be carried on.

"Logs of *Mora* may be got in any quantity of from three to four feet square, or even larger, if necessary, but those giving two feet square is the commonest size, that is, after the sap-wood is removed, and from one hundred feet downwards in length; logs of eighteen inches to two feet square, and fifty to sixty feet long, would be more conveniently transported than if they were larger. I measured one fallen tree which was eighty feet to the first branches, and would square over two feet; another standing tree I measured which was forty-two feet in circumference at six feet from the ground. The common height of the *Mora* tree is one hundred to one hundred and thirty feet. It is the loftiest of all our forest trees. I consider that the forest which I have above

indicated will average from twelve to fifteen full-grown trees to the acre, each tree containing from three hundred to three hundred and fifty cubic feet of timber at the least. The reputation which the timber of the *Mora* tree has obtained in the markets of England is the best guarantee of its quality. I believe it is a most valuable wood for planking, or the ceiling of war-vessels, as it splinters even less than oak. My own experience is that it is one of the toughest of woods.

"Timite (a kind of Palm, furnishing the best possible kind of thatch) is abundant on the spot; good water is also plentiful; good anchorage for large shipping at the distance of one mile or less, where vessels might anchor in safety at all seasons of the year. Hurricanes are unknown in the Gulf of Paria, and indeed it appears extraordinary that forests of such magnitude and value, and so easily accessible, should so long have escaped the axe and the saw.

"I have brought specimens of *Mora* timber for your Excellency's inspection. That marked No. 1 is a piece of plank taken from a fallen tree, which has doubtless been on the ground and exposed to weather some twenty years. That marked No. 2 is the cross section of a small tree which measured ninety feet to the first branches.—W. P."

On the 8th of November, 1854, Governor Elliot addressed another most satisfactory letter to Sir George Grey, of which the following is a copy:—

"In my despatch No. 63, dated the 9th of September last, I remarked that I should visit the *Mora* forest which has now been ascertained to crop out on the western shores of this colony, as soon as the mitigation of the epidemic enabled me to leave the seat of government, and I have now the honour to report that I have accomplished that purpose.

"The forest comes down within three hundred yards of the beach, at the mouth of a small stream, not named in Wyld's map, about five miles W.S.W. of Puerto del Guapo, being the second river to the westward of an abandoned estate called 'La Paia,' marked on the map, and belonging to the Crown.

"The anchorage is safe, and perfectly smooth at all seasons of the year, and there was eighteen feet of water, half flood (spring tides), within half a mile of the beach. We landed at the mouth of the stream, and after crossing a ridge of about thirty feet of height, and

wading through a mangrove swamp not exceeding two hundred yards of width, struck at once into the forest. The ground there is hard, and perfectly level, so that the tram modes of movement are susceptible of application from the body of the forest to the edge of the swamp, without expensive levelling, and with little or no other charge than the felling of the trees and laying down the trams, which might be formed of the timber itself.

"The forest consists almost exclusively of *Mora*, and I have no doubt, from the accounts I have received from authentic sources of information, that it is the western extremity of the great belt of timber-lands running parallel with the whole southern shores of the colony, and extending upwards along large parts of its eastern side.

"It is the nature of this noble tree to carry its substance in straight columns, free of branches, to great heights, and I saw several which would, I think, have squared at least two feet, in lengths of upwards of seventy feet. In the absence of exact enumeration, I am unable to speak positively as to the average number of merchantable trees to the acre, but I may remark generally, that the number and the weight of those prodigious masses of hard timber was one of the most amazing proofs of vegetative vigour which I have ever witnessed.

"Having now convinced myself of the ease of access to this timber, of the facility with which it may be shipped at all seasons of the year, and of the immediate returns to the moderate amounts of capital which would be requisite for the working of the forest in the most effective manner, I feel well warranted in confirming the impressions of the great value signified in my despatch before alluded to.

"I shall of course do what I can, without loss of time, to render the timber available for our own contemplated public buildings.

"I hope in the course of a few weeks to be able to forward to the Surveyor-General of the Navy, the whole section of a tree of considerable magnitude.—I have, etc., CHARLES ELLIOT."

Note from SIR JOHN BOWRING, relating to the flowering of the RICE-PAPER PLANT, dated Hongkong, Dec. 2, 1854 (which was accompanied by a flowering specimen).

"This is one of your *desiderata*—the flower of the Rice-Paper Plant. The said flowers grow in wand-like branches, some of them four feet

long, which to your all-learnedly botanical eye, will be a sufficient description. The plant from which I plucked this flower is about seven feet high, and covers, I should think, a circumference of twenty feet."

These flowers prove that we are correct in referring the plant to *Aralia*, in the larger sense of the genus. The fruit is still a desideratum; but Sir John Bowring has our grateful thanks for the way in which he (and we must not exclude his son) has elaborated the history of this previously unknown plant.

NOTICES OF BOOKS.

INDEX FILICUM; *a Synopsis of the Genera of Ferns, with their Characters, and an Enumeration of the Species, with their Synonyms, References, etc. etc.*; by THOMAS MOORE, F.L.S., etc.

Last month we announced a '*Nomenclator Filicum*,' from the pen of a German author, Dr. J. W. Sturm, of Nürnberg (see p. 60), and now we have the pleasure to publish the notice of a work of similar import, an '*Index Filicum*' of our own country. Mr. Moore issues the following PROSPECTUS, and Specimens or EXAMPLES:—

"The acknowledged want of some recent enumeration of Ferns, showing the relation between their old and new names, and embodying the modern principles of classification, led the publisher some time since, to project a volume of convenient bulk and of moderate price, which should supply this want.

"In undertaking the somewhat difficult task of preparing such an enumeration, the author proposed to himself an extension of the original design, by adding—(1) A complete series of index-like references to the most useful general publications already existing on this subject, especially those of Swartz, Willdenow, Sprengel, Presl, Kunze, Hooker, and Fée; (2) References to figures whensoever practicable; and (3) An indication of the geographical distribution of the species.

"On this basis considerable progress has been made during the last few months, in the collection and arrangement of materials for the work. The time has therefore arrived at which the publisher may announce his intentions, and the author may venture to solicit the aid of botanists in the execution of his task. In particular, he would solicit information or materials which may throw light on such of the species in

the older enumerations of Swartz and Willdenow, as may still remain obscure; and also such as may assist in the recognition of the new unfigured species of later writers.

"While adopting the modern system of classification, which was first generally applied with so much sagacity by Presl, and has since been modified by the accurate and useful labours of Mr. J. Smith and M. Fée, a considerable amount of close investigation has led the author to the conclusion that the genera have been too much multiplied, and it will be his object to consolidate what appear to be unnecessary subdivisions. There can be no doubt, moreover, that species have been too much multiplied, but the difficulties of accurately consolidating these false species without vast materials for comparison, is so great, that he fears he may not accomplish in this department so much as he desires. Any materials in aid of this object, will, however, be thankfully appreciated.—For facility of reference, the genera and species in the body of the work will be arranged in alphabetical order.—Those botanists who may be disposed to render aid in this undertaking, by the communication of specimens, are invited to forward them to the author, under cover to the publisher."

EXAMPLES.

HEWARDIA, *J. Smith, Hook. Jour. Bot.* iii. 432, t. 16–17.

ADIANTI SP. *Auct.*

adiantoides, *J. Sm. l. c.*—F. Guiana.—Fée 122.

Adiantum Hewardia, *Kze. Schkr. Fil. Sup.* 104. t. 49.—Hk. ii. 7.

dolosa, *Fée, Gen.* 122.—Brazil: Surinam: Ecuador.

Adiantum dolosum, *Kze. Linn.* xxi. 219.—Hk. ii. 6, t. 79 B.

Lindsaea macrophylla, *Kze. Anal. Pter.* 37, *in part.*—*fide Hook.*

Leprieurii, *Fée, Gen.* 122.—Berbice: F. Guiana.

Adiantum Le Prieurii, *Hook. Sp. Fil.* ii. 31, t. 82 B.

serrata, *Fée, Gen.* 122.—Brazil.

Adiantum obliquum, *Schlecht. in Sched.*—*fide Fée.*

Wilsoni, *Fée.*—*Adiantum Wilsoni*, *Hook.*

LEPTOSTEGIA, *D. Don, Prod. Fl. Nep.* 14.

lucida, *D. Don.*—*Onychium lucidum*, *Spreng.*

CASSEBEERA, *Kaulfuss, Enum. Fil.* 216.

ADIANTI SP. *Auct.*

argentea, *J. Sm.*—*Cheilanthes argentea*, *Hook.*

cuneata, *J. Sm.*—*Cheilanthes cuneata*, *Link.*

farinosa, *J. Sm.*—*Cheilanthes farinosa*, *Kaulf.*

gleichenioides, *Gardn.: Hook. Ic. Pl.* t. 507.—Brazil.—Hk. ii. 119.

intramarginalis, *J. Sm.*—*Pteris intramarginalis*, *Kaulf.*

micromera, "Hort. Ber." Kl.—*Adiantopsis paupercula*, *Fée.*

pedata, J. Sm.—*Pteris geraniifolia*, Raddi.

pinnata, Kaulf. *En. Fil.* 217.—Brazil.—Spr. 118: Pr. 155: Hk. ii. 119: *Kze.*

Anal. Pter. 37, t. 24.

pteroides, Presl.—*Adiantopsis pteroides*.

triphylla, Kaulf. *En. Fil.* 216.—Buenos Ayres: Brazil.—Sw. 120; W. 428: Spr.

118: Pr. 155: Hk. ii. 118: Fée 119. *Hook. Gen. Fil.* t. 66 A.—*Adiantum*

triphylum, *Smith Ic. ined.* t. 74: Sw. 120.

VICTORIA REGIA, or the Great Water-Lily of America; with a brief Account of its Discovery, Introduction, and Cultivation: with Illustrations by WILLIAM SHARP, from specimens grown at Salem, Massachusetts, U.S.A.; by JOHN FISH ALLEN. Elephant folio, with 6 coloured plates.

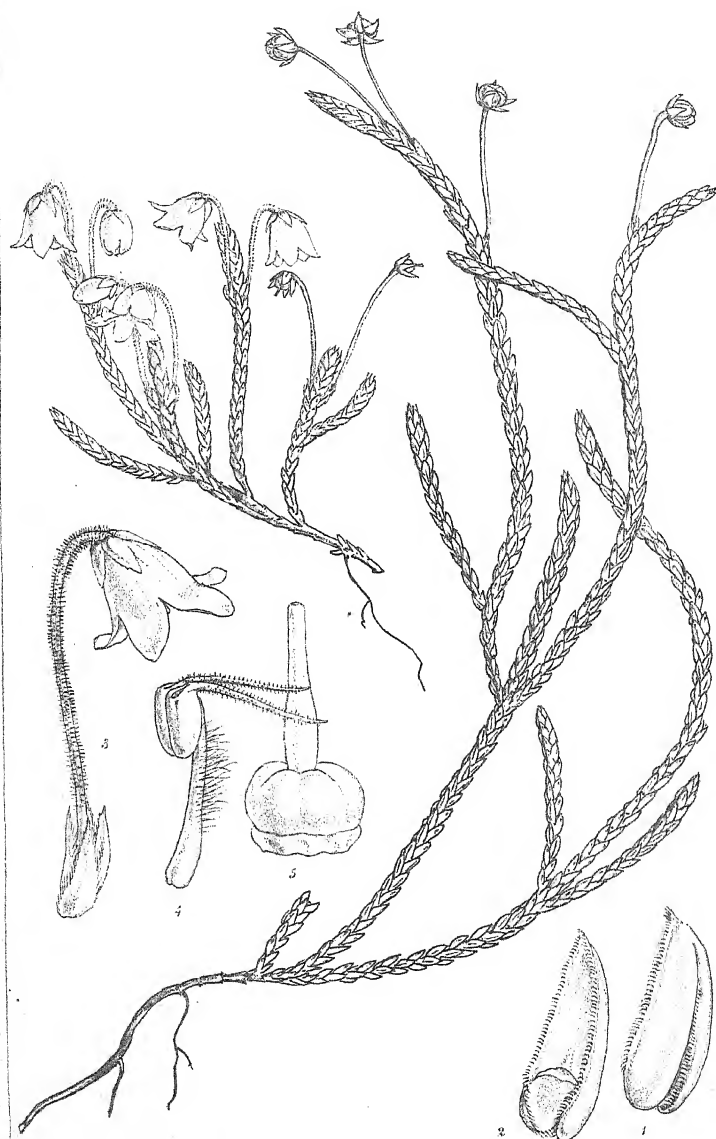
We have already in the pages of our Journal recorded the particulars of the introduction and first flowering of this royal aquatic in the United States, in the garden of Caleb Cope, Esq., to whom the present work is with great propriety dedicated. We believe the bright suns and warm summers of a Pennsylvanian climate, combined with good cultivation, have been the means of occasioning the plant to yield larger flowers, if not larger leaves, than have been produced in England. No wonder, then, that a talented artist and a zealous horticulturist should desire to record with pen and pencil the beauties of this flower: and this is accomplished on a plan and size worthy of the subject. The dimensions of the book are those of the largest elephant folio (twenty-five inches long, and twenty broad), the plates executed in lithography by Mr. William Sharp, and coloured true to life: no attempt to outdo nature. The first plate represents the germination of the plant; the second, the opening of the flower in its pure white state, floating on the water, accompanied by leaves and buds; the third exhibits the highly curious structure of the back of a single leaf, with its massy projecting and anastomosing ribs; the fourth, the intermediate stages of bloom and flowers; the fifth, the fully expanded flower, in all its glory; the sixth and last plate, a peculiar state of the flower, described at p. 13 of the text.

The descriptive part comprises, the history of the discovery, the names, the cultivation, details of the entire plant, in which the author is aided by the Rev. J. Russell: then follows an elaborate account of its cultivation in the United States: this is succeeded by the special

account of the cultivation at Mr. Allen's garden at Salem, and here the author has said much that may be useful to all who can afford to cultivate this rarity; and lastly, a full description of the plates.—The whole is alike honourable to the state of the arts and horticultural skill and knowledge in the United States.

TUINBOUW; FLORA van NEDERLAND en zijne overzeesche Bezittingen, etc. etc. Leyden. 8vo. 1854.

This is an important horticultural and botanical work, of which twelve numbers, constituting the first volume, are now before us, and we regret that our ignorance of the Dutch language prevents our giving such a notice as would render it justice. It is a publication that combines the beautiful figures, corresponding with the 'Botanical Magazine' of this country, with a vast amount of varied horticultural information, such as has been hitherto found in the 'Gardeners' Chronicle' alone; the paper, type, and execution such as would do honour to any country, and conducted, we believe, mainly, if not entirely, by Mr. W. M. De Brauw, and our valued friend Dr. W. H. De Vriese. Under such auspices it cannot fail to contain much that is useful as well as scientific. It opens with a highly coloured figure, and description, of a new Japan Apricot, and the same number contains a remarkably well executed figure of *Wellingtonia gigantea*. Among other interesting subjects, will be found a fine new *Hoya*, *H. Motoskei*; a figure and description of a noble Banyan, *Ficus Benjamina*, L.; admirable figures of *Nepenthes Rafflesiana*, of which that at Plate IX. is particularly satisfactory and graceful, showing an entire plant. A considerable portion of the tenth number is devoted to a history and a Japanese figure of the *Dioscorea Japonica*, or Japanese Yam, an esculent of no small importance just now in the horticultural world, when small tubers, less than a hazel-nut, are selling for half-a-crown. Plate XIV. gives a charming representation of *Picea alba*, all the upper branches fringed with the rich brown-coloured cones. The last number has a figure of *Bilbergia thyrsoidea*, Mart., var. *zonata*, and a representation of the Palm-house at Kew, accompanied by a description from the pen of Dr. De Vriese. We heartily wish the work all the success it merits: it ought to be encouraged by every Hollander, in whom it is known there is an innate love of flowers.



Cassiope selaginoides.

Hook. & Thoms. del.

Fitch. lith.

Vicent. Berolka. fr.

KEW GARDEN MUSEUM; or, an *Account of the Origin and some of the Contents of the MUSEUM OF ECONOMIC BOTANY attached to the ROYAL GARDENS OF KEW*; by the Director, SIR W. J. HOOKER, K.H., F.R., A., and L.S.

(Continued from vol. vi. p. 26.)

Ord. CRUCIFERÆ. CRUCIFEROUS FAMILY.

This Family, or Natural Order, derives its name from the cross-shaped petals, there being almost invariably four uniform petals to the flower, placed in opposite pairs, hence cross-shaped; and the six tetradynamous stamens (four long and two short) afford almost as constant a character. It abounds in genera and species, chiefly inhabiting temperate climates: not one of them is poisonous or hurtful: a great number are useful to mankind, especially the less acrid, as esculent, culinary, affording oil in the seed, and oil-cake for feeding cattle, and valuable manures. Many are antiscorbutic, particularly the *Cochleariæ* (Scurvy-grasses); but such plants become inert when dried. They possess a certain degree of acidity, and they contain sulphur and nitrogen, to which is supposed to be due their animal odour when rotting.

As this Family of Plants is rich in culinary and horticultural and agricultural objects, not a few of them owing their peculiarities to cultivation, and as our extensive collection of them is the Messrs. Lawson's liberal gift, already spoken of, I must here refer to the excellent list of '*The Lawsonian Collection; or Synopsis of Vegetable Products of Scotland in the Museum of the Royal Gardens of Kew. Edinburgh: private press of Peter Lawson and Son; 1852,*' for what concerns the agricultural products of this Family. When not otherwise expressed, it is to be understood that such articles are part and parcel of that Collection.

Water-cress. *Nasturtium officinale*, R. Br. Britain. Seed. Young plants are a favourite salad, pungent and antiscorbutic. Often cultivated in artificial running streams for sale.

Cuckoo-flowers. *Cardamine pratensis*, L. Britain. Medicinal: considered useful as a stimulant, diaphoretic, and diuretic.

Horse-radish. *Cochlearia Armoracia*, L. Europe. Seed, and wax model of root. Pungent, acrid, stimulant, and vesicant. Scraped roots much used as a condiment.

Roogee-root. *Megacarpæa polyandra*, MS. in *Herb. Hook.* Kumaon. (Captain Strachey and Major Madden.)

Rose of Jericho. *Anastatica Hierochuntica*, L. Syria. (B. Page, Esq.) A singular but small plant, growing in exposed deserts, where it is often uprooted and blown about by the winds; and has the property of rolling up like a ball in dry weather; opening, spreading out its branches in wet weather. The most absurd fables are related of the virtues of this plant in the East, and greedily believed by the vulgar. The present is the "Rosa de Hiericho" of Dalechamp, and "Rosa hierochuntica" of Commelyn: in short, the original "Rose of Jericho." But the same name has of late been applied to a *Lycopodium* of Mexico (*L. lepidophyllum*, Hook.), possessing similar hygrometric properties.

Garden-cress. *Lepidium sativum*, L. Europe. Seed, and oil. The young plants, with those of *Mustard*, are frequently eaten as "mustard and cress," and are extremely wholesome and antiscorbutic.

Gold of Pleasure. *Camelina sativa*, Crantz. Europe. Seeds, and oil. Much cultivated for the oil throughout Europe, but the refuse is considered too acrid for cattle. Brooms are made from the dry haulm.

Woad. *Isatis tinctoria*, L. Seed, and specimens prepared for dyeing. Formerly much used as blue-dye in this country.

CABBAGE TRIBE. Cabbage, Rape, Turnep (*Brassica*).

Common or Wild Cabbage. *Brassica oleracea*, L. Drawings and models. Native of the sea-coasts of the middle and south of Europe, including England. This is considered to be the origin whence the numerous cultivated varieties of *Cabbages* have sprung. "From this circumstance," write Messrs. Lawson, "it is often alluded to as a remarkable proof of the advantages resulting from a careful cultivation, improvement, and selection of the most deserving varieties of any of our cultivated economical plants. Nor can a more suitable example be adduced than to compare this insignificant weed-like plant of the sea-coast with the gigantic growth of the Tree- or Cow-Cabbage, the large close head of the Drumhead-Cabbage, or with the different forms or habits of growth apparent in the Brussels Sprouts, Red Cabbage, Cauliflower, Kohl-Rabi, and various other forms."

A large proportion of the above are very unsuited to a Museum, from the difficulty or impossibility of preserving such succulent products, and

they would not be very instructive. The seed, faithfully and correctly named, several models in wax and drawings, are what we possess, and these, as well as the other esculent *Cruciferae*, are fully described in Messrs. Lawson's work. We confine our notice to some of the better-defined kinds.

Tree or Cow Cabbage. Seed and stems, and walking-sticks. Often called *Chou Chevalier*, *Chou à Vaches*, *Jersey Kale or Cabbage*. This is certainly one of the most remarkable of the Cabbage kind, having a hard and woody stalk, averaging, Messrs. Lawson say, five feet high. No one can visit Jersey without being struck with this plant in the kitchen gardens, not five feet high only, but frequently eight and ten feet; and we remember a dried stalk in Mr. Lambert's possession measuring thirteen feet in length. This great length is mainly produced by daily pulling off the lower leaves, as fodder for the cows, leaving foliage only at the top; thus a small garden of them has almost the appearance of a little plantation of Palms. Planted close, as living fences, they keep out fowls and small animals. Sheds are thatched with the dried stems. They serve for supporting kidney-beans, peas, etc., and "as cross-spars" for the purpose of upholding the thatch or roof of the smaller classes of farm-buildings, cottages, etc., and when kept dry, are said to last upwards of half a century. At a distance from the coast, and in colder latitudes than Jersey, we have always seen this Cabbage degenerate. Some of our dried stalks measure nine feet in length, sent from Jersey by Mr. J. Dunscombe. The walking-sticks are almost handsome.

Of the other varieties of Cabbage we reckon, either in the shape of seeds, or drawings, or models, forty-one kinds, including *Broccoli*, *Cauliflower*, *Kohl-Rabi*, etc.; many are probably hybrids, though of great importance for agricultural and culinary purposes.

Turnep. *Brassica Rapa*, *L.* Europe. This includes all the varieties of the Common Turnep, of which forty-four sorts are represented by seed, drawings, or models, in the Museum. That state of the root called "*Aubury*," or "*fingers and toes*" (wax model), is well known to farmers, and is a disease supposed to be caused by the soil.

Swedish Turnep, or *Common Wild Navet*. *Brassica campestris*, *L.* Eight varieties of this are in the Collection, and drawings of several. Oil is extracted from the variety called *oleifera*.

Common or Winter Rape, Cole-seed. *Brassica Napus*, *L.* Seed and

oil (common and refined), and Rape-cake. The oil is commonly known as *Rape oil*, and the crushed residuum is much used for fattening cattle, under the name of *Rape-cake*.

Mustard. Seed, oil (Camphine Company), prepared mustards, with the *bran* or husks, and lawn-sieve used in separating the mustard used at table from the bran. (Mr. Spencer.) Two species are in general use in England; *Sinapis alba*, L., yielding the white or Essex mustard, and *Sinapis nigra*, L., Cambridge brown mustard. Spanish mustard is probably from one of the above, though the plant is called by Lawson *S. Hispanica*. In India oil is extracted extensively, according to Dr. Alexander Hunter, from *Sinapis Chinensis* and *S. glauca*, as well as *S. nigra*.

Sea-kale. *Crambe maritima*, L. Europe. Wild in England. Seeds, and wax model. A well known and delicate vegetable, much improved by the skill of the gardener.

Crambe Kotschyana, Boiss. Scinde. (Dr. Stocks.) Roots of this we have received as an esculent; as *Crambe tartarica*, L., is considered in Hungary.

Radish. *Raphanus sativus*, L. Of this familiar root there are many varieties, if not hybrids, models and seed. Oil is yielded abundantly from the seed.

Ord. CAPPARIDÆ. CAPER FAMILY.

A group or family of no great importance; properties considered similar to those of *Cruciferae*: few kinds are employed in Europe, except

Capers. These are the *flower-buds* of a suffruticose plant, common in the South of Europe on rocks and walls, the *Capparis spinosa*, L., which has a prickly stem, as its botanical specific name implies, and bears large white flowers. In the warm parts of France and in Italy it is much cultivated. The flower-buds are gathered before expansion, and preserved in vinegar, and they constitute a very considerable article of trade.

Gum of *Capparis scabrida*, H. B. K., is brought to us from Puna, by Mr. Seemann, but of its properties we are ignorant.

Wood of *Capparis grandis*, L. Madras. (Dr. Wight.)—Fruits of other and unknown species of *Capparidæ*, only of botanical interest. *Capparis excelsa* of Madagascar is said to afford planks four feet broad.

Ord. RESEDACEÆ. MIGNONETTE FAMILY.

Few are unacquainted with the general appearance and curious structure of the flowers of the common Mignonette: it is a native of warmer climates than ours; but we possess in England, and it is common throughout Europe, the

Yellow-weed, or *Weld*. *Reseda Luteola*, L. Seeds, and stalks. (Messrs. Lawson and Mr. R. Clapp.) In appearance the plant a good deal resembles the Garden Mignonette: yields a yellow dye from the stems, which, "among dyes of an organic nature, rank next to the Persian Berry (*Rhamnus infectorius*, L.), for the beauty and fastness of the dye." The colouring principle is considered the strongest when the plant is in seed, and at that season, after being simply dried, it is brought into the market. This particular colouring principle is called by Chevreuil *luteoline*. Oil of Weld-seed is the produce of this *Reseda*.

Ord. FLACOURTIANEÆ. ARNOTTO FAMILY.

An entirely exotic and mostly tropical Order, affording

Arnotto, or *Annotto*, a red dye from the *Bixa Orellana*, L. Native of South America and the West Indies, cultivated also in the East. *Fruit*, seeds, and the cakes from various countries. The fruit contains a thin pulp surrounding the seeds, which is collected and formed into *cakes* or *flag*, or into *rolls*: the former comes chiefly from Cayenne, the latter from Brazil. In this country it is mostly employed in staining cheese and butter, for tingeing varnishes, oils, spirits, etc., and for dyeing silk. Sometimes it is mixed with chocolate, and imparts a beautiful tint. Also used by the Caribs, and other tribes of Indians in South America, for painting their bodies.

Wood of *Bixa Orellana*, L. *Khasya*. (Dr. Hooker.)

Mandingo Snuff-boxes, the fruit of *Oncoba spinosa*?, Försk. *Gambia*. (Dr. Daniell.)

Natal Snuff-boxes, apparently made of the same fruit (*Oncoba spinosa*?) *Natal*. (Captain Garden.)—Some *Flacourtiaceæ* are said to afford eatable fruits, and some medicinal properties.

Ord. CISTACEÆ. CISTUS FAMILY.

The *Cistus* Family is familiar to most people from the species of Rock-rose, *Helianthemum*, of our own country (whose stamens on the

recent flower, if suddenly pressed between the finger and thumb, expand in a very remarkable manner), and the true *Cistus*es of our gardens, distinguished by the beauty yet short duration of their flowers. One of the most common is the *Gum-Cistus* (*Cistus ladaniferus*, L.), so called because the whole plant, in warm weather, exudes a sweet, gummy, or glutinous substance, which has a strong balsamic scent, perfuming the circumambient air to a great distance. From the Latin specific name (*ladaniferus*) it might be supposed that this species yields the Gum-Ladanum, or Labdanum, but such is not the case: several species have a similar resinous exudation.

Ladanum, or *Labdanum*, a resin considered to be the product of *Cistus Creticus*, L. Native of Crete and Syria. Our specimens are from D. Hanbury, Esq. It possesses stimulant properties, and was formerly a constituent of some plasters, but its use is now obsolete, and it is seldom imported. It is the *Ledon* of Dioscorides, in whose time the gum, which exuded from the glands of the leaves, was obtained by driving goats among the shrubs, or by these animals naturally browsing upon them, when the substance adhered to their fleeces and beards. Now that this gum is collected to supply a more extended demand, a peculiar instrument is employed for the purpose, which is described and figured by Tournefort; and his accuracy is attested by Sieber, in his 'Voyage to Crete.' "It is a kind of rake, with a double row of long leathern straps. It is used in the heat of the day, when not a breath of wind is stirring: circumstances necessary to the gathering of *Ladanum*. Seven or eight country-fellows, in their shirts and drawers, brush the plants with their whips, the straps whereof, by rubbing against the leaves, lick off a sort of odoriferous glue sticking to the foliage. This is part of the nutritious juice of the plant, which exudes through the texture of the leaves like a fatty dew, in shining drops, clear as turpentine. When the whips are sufficiently laden with this grease, they take a knife and scrape the straps clean, making it up into a mass or cakes of different size, and this is what comes to us under the name of *Ladanum*, or *Labdanum*. A man who is diligent will gather 3 lbs. per day, or more, which sells for a crown on the spot. The work is rather unpleasant than laborious, because it must be done in the sultry time of the day, and during the most dead calm; and yet the purest *Ladanum* cannot be procured free from filth, because the winds of previous days have blown dust on the shrubs."

About 50 cwt. of it are annually collected in Crete, and sent exclusively to Constantinople.

Gum of Cochlospermum Gossypium, DC., called *Gum Kuteera*, DC. Soane River, India. (Dr. Hooker.) Properties similar to Gum Tragacanth, for which it is substituted in India. Dr. Hooker says that the white ants are very fond of it.

Leaf Bellows; made entirely of the foliage of the *Cochlospermum Gossypium*, compactly stitched together, the handle alone and the snout being made of Bamboo. These are used in smelting iron by the natives of the hill-country of Soane Valley in India. (Dr. Hooker.) See his Himalayan Journals, vol. i. p. 53.

Capsules and seeds of Cochlospermum Orinocense, Steud. Barra do Rio Negro, Brazil. (Mr. Spruce.) Remarkable for the beautiful structure of the seeds. *C. tinctorium* yields a yellow dye.

Ord. VIOLACEÆ. VIOLET FAMILY.

The *Violets* and the *Pansies* may be taken as the types of this Family: these have irregular petals; some tropical kinds, of whose properties we know little or nothing, have regular petals; but the former, whether of temperate or warm climates, are more or less employed medicinally, the roots possessing highly emetic properties. Of the genus *Ionidium*, for example, one species has received the name of *Ionidium Ipecacuanha*, Vent., because of the purgative property of its roots, which have been employed as substitutes for the officinal Ipecacuanha (*Cephaelis Ipecacuanha*, Rich.). Of this, a native of Brazil, no samples are in our possession; but nearly allied to it is the

Cuicunchilli, or *Cuichunchulli*, of South America, for example, from Cuença, Riobamba, and Colorado. Roots. From specimens of the plant long ago sent to me by the late Dr. Bancroft, I ascertained the roots to be those of *Ionidium parviflorum*, Vent. Dr. Lindley determined that of Cuença to be from *I. microphyllum*, Humb.; a species probably not distinct from *parviflorum*. Emetic and purgative. Employed as a remedy for the disease called Elephantiasis tuberculata.

Wine of Cuichunchulli, South America; a tincture of the root.

Sweet Violet. *Viola odorata*, L. Seeds and roots. Europe. The roots have been used medicinally, as emetic and purgative (and so have those of the *Dog Violet*, *V. canina*, L.); but the plant is chiefly cultivated for the delicious odour of the flowers. They are used

in the preparation of the officinal syrup; and as a test for acids and alkalies.

Ord. MORINGACEÆ. HORSERADISH-TREE FAMILY.

This Natural Order, of doubtful position, is now generally placed near the Violet Family; but it requires a botanical eye to distinguish the affinities. It is confined to one genus, *Moringa*.

Ben-oil, *Pods* and *seeds* of *Moringa pterygosperma*, Gært. (*M. oleifera*, Lam.) An Indian tree, but cultivated in Jamaica, whence our sample of the oil was sent by the late Dr. M'Fadyen. It is a pure fixed oil, much used by perfumers on account of its not easily becoming rancid, and by watchmakers for oiling the machinery of clocks and watches, because it does not freeze. The roots have so exactly the flavour of Horseradish, that they are a common substitute for it among Europeans, both in the East and West Indies. Pods used in curries, on account of their peculiar flavour.

Mocheris Gum; so called in Scinde. (Dr. Stocks.) Exudes from wounds made in the bark of *Moringa pterygosperma*, Gært., agreeing in some of its properties with Gum Tragacanth.

Wood of *Moringa pterygosperma*, Gært. Scinde. (Dr. Stocks).

Ghalee. The seeds, so called, of *Moringa aptera*, Gært. Scinde. (Dr. Stocks.) This species, if it be really distinct, is considered by De Candolle to yield the *Ben-oil*, to judge from his expression, "Beenalbum offic."—Probably a similar oil is afforded by both species.

Ord. DROSERACEÆ. SUN-DEW FAMILY.

The well known *Sun-dews*, or species of *Drosera*, give the name to this Family: they are not, that I am aware of, employed economically; but I may here observe that nearly all the species in the Herbarium stain the paper, especially by their roots, with a fine purple colour resembling cochineal, and that Mr. Drummond has been so struck with this in the large-rooted Swan River kinds, that he has endeavoured to direct public attention to the fact, feeling assured they would yield a valuable dye.

American Fly-trap. *Dionæa Muscipula*, L. South States of North America. A botanical curiosity, of which living plants may generally be seen in the stoves during summer. The Museum contains a large drawing of it. The *Droseras* are remarkable for their fly-catching

property, which is due to viscid glandular hairs. In *Dionæa* the leaf is terminated by an apparatus resembling a rat-trap. Two fleshy lobes will be there seen fringed with a row of bristly spines, in fine summer weather spreading out horizontally; upon the disc are two or three solitary bristles; in these bristles of the disc is the seat of movement. Let an insect alight on this fleshy appendage and brush these bristles in its progress, the two lobes will close upon the victim, piercing him with the spines; and the more the insect struggles, the more strongly do the lobes press upon him. When his struggles cease by exhaustion and death, the lobes again expand. Of course a pin or a straw applied to the same part of the lobes will occasion the same manœuvre.

Ord. POLYGALACEÆ. MILKWORT FAMILY.

The common *Milkwort* of our heaths and dry pastures is a familiar example of this Family, of which the leaves, bark, and roots are, for the most part, bitter and astringent.

Seneka-root. Polygala Senega, L. North America. Sometimes called *Snake-root*, having been introduced into medicine, in the early part of the last century, by Dr. Tennant, a Scotch physician residing in Pennsylvania, as a remedy for bites of venomous reptiles. In small doses it is diaphoretic, diuretic and expectorant; in larger, emetic and purgative; and though perhaps exploded as a cure for snake-bites, it is an exceedingly valuable remedy in certain stages of bronchial and pulmonary inflammation.

Rhatany-root. Krameria triandra of Ruiz and Pavon. Native of Peru; brought into use as a medicine by its discoverers on account of its powerfully-astringent and tonic qualities. Said to be used in Europe, together with Gum Kino, for adulterating port-wine.

Twigs of Mundia spinosa, L. Native of the Cape. We received it from the Great Exhibition of 1851, among a collection of Cape drugs, from Dr. Pappe, who says a decoction is used, apparently with some effect, in Atrophy, Phthisis, etc.

Natural Broom. Comesperma scoparium, Steetz. This is sent to us by Mr. J. Drummond, from the Swan River Settlement, where, as its botanical specific name indicates, it is used as a broom. From a small knotty root-stalk a quantity of slender twiggy branches arise, the whole forming a natural broom, which has only to be cut to be ready for use.

Ord. TAMARICINEÆ. TAMARISK FAMILY.

This Natural Family is almost entirely confined to the genus *Tamarix*. The species are natives of the warm and temperate parts of Europe and Asia, and have bitter and astringent bark. Some species are said to afford sulphate of soda in great abundance. A Manna, called *Manna of Mount Sinai*, is an exudation from *Tamarix mannifera*, according to Ehrenberg, occasioned by an insect, a species of Coccus (*Coccus manniparus*) which inhabits the shrub: and this "Manna" consists wholly of pure mucilaginous sugar. We have not yet been so fortunate as to procure specimens.

Sakun, or *Tamarisk Galls* of Scinde. *Tamarix articulata*, Dr. Stocks. Highly astringent, and used both in medicine and dyeing.—*Mahee*. (E. I. C., without botanical name.) From Bengal; apparently the same. Dr. Lindley says, that such galls are the produce of *Tamarix Indica*, *dioica*, *Furax*, and *orientalis*. *Tamarix* (*Myricaria*) *Germanica* and *herbacea* are occasionally, the same author asserts, used medicinally.

Wood of Tamarix dioica, Roth. Handsome and close-grained. Scinde. (Dr. Stocks.)

Ord. CARYOPHYLLACEÆ. CHICKWEED FAMILY.

The common *Chickweed* (*Stellaria media*, Sm.), the *Pink*, the *Soapwort*, etc., are characteristic of this family, which though rich in genera and species, contains few plants possessing any marked properties.

Clove July- (or Gilly-) flower: the *flowers* of the *Clove Pink*, *Dianthus Caryophyllus*, L., have a place in our Pharmacopœias, used as a syrup. They have a pleasant aromatic smell, and a bitterish subastringent taste, "and were formerly employed in medicine on account of their colour."

Soapwort; root and dried herb. *Saponaria officinalis*, L. Native of Britain and Europe. Possesses saponaceous property, as the generic and English name implies; when bruised and agitated in water, it raises a lather like soap, and may be used as a substitute for it.

Arenaria rupifraga, Fenzl; tufts of. Tibetan Himalaya. (Drs. Hooker and Thomson, and Colonel Munro). This plant is interesting in connection with geographical botany, growing at the greatest elevation of any Phænogamic or flowering plant (in contradistinction to Cryptogamic, such as Mosses, Lichens, etc.) in the world. Dr. Hooker's specimens were gathered at between 16,000 and 18,000 feet above the

level of the sea: and the extraordinarily dense and tufted manner in which they grow (looking like, and by the unbotanical eye mistaken for, a compact Moss) indicates the exposure in the clefts of rocks to extreme cold and driving hurricanes. One of the most elevated of flowering plants in our own mountains is a nearly allied one to this, and belonging to the same Natural Family, viz. the *Cherleria sedoides*, Linn.

Pharnaceum lineare, Thunb., *flowering branches*. Cape. From the medical collection in the Great Exhibition. The infusion is employed in pulmonary affections. It has a pleasant, aromatic, bitter taste, and is somewhat mucilaginous and slightly astringent. (Dr. Pappe.)

Ord. MALVACEÆ. MALLOW FAMILY.

An extensive Natural Family, chiefly inhabiting warm climates, eminently characterized by the general mucilaginous properties, and the copious fibre of the inner bark. In England we have only the *Mallows*, *Marsh-Mallow*, and *Tree-Mallow*; but warm countries produce numerous species of *Hibiscus*, *Sida*, etc., which are generally shrubs and small trees, often with very handsome flowers; and in such regions alone, the *Cotton* is extensively cultivated, and forms a staple article of trade with almost all parts of the civilized world. In that instance it is the fibre *surrounding the seeds* which is so valuable, under the name of *Cotton*. None are unwholesome, and some are esculent. Dye is extracted from some. The beautiful flowers of *Hibiscus Rosa-Sinensis*, L., are used by the Chinese to blacken their eyebrows and their shoes.

Marsh-Mallow. Guimauve, *Fr.*, *Althæa officinalis*, L. Dried flowers and foliage. Europe. Demulcent and pectoral.

Hollyhock. *Althæa rosea*, L. South of Europe. Dried flowers. Mucilaginous and demulcent. The leaves dye blue.

Ochro, or *Ochra*. *Hibiscus* (*Abelmoschus*, *W. et A.*) *esculentus*, L. *Pods and Wood*. Tropical America and East India. Cultivated for the sake of the green pods or seed-vessels, which are much employed in thickening soups, while the leaves are used for poultices. *Model* of the pod carved in wood by the natives of Bombay, from the soft wood of *Givotia rötteriformis*, Wight, Ic. t. 1889. On being fresh cut the wood is very heavy: and it is when thoroughly dry that it becomes so soft and light. (J. Law, Esq.)

Rope made of the fibre of *Hibiscus tiliaceus*, L., *Fibres* of *Hibiscus*

Sabdariffa, L., and *H. cannabinus*, L., and cordage of *Thespesia populnea*, Corr., and from other *Malvaceæ*, are in the Collection.

Musk-seeds. *Hibiscus Abelmoschus*, L. (*Abelmoschus moschatus*, W. et A.) The kidney-shaped seeds have a powerful musky odour, and are said to be roasted with coffee by the Arabs: tincture used against serpent-bites.

Gingodau. *Sida sp.* Seed. (Dr. Bromfield.) Used in Nubia and Soudan as a substitute for Coffee.

Mallow. *Malva sylvestris*, L. Britain. Dried herbage used as emollient and demulcent, and in poultices for external application.

COTTON.

From different supposed species of *Gossypium*, generally known as *G. herbaceum*, and *G. Barbadense*. The valuable substance is the hairy covering of the seeds. Volumes have been written on the history, manufacture, and commercial importance of this plant; and the reader will find a valuable Treatise in the volume of Dr. Royle, 'On the Culture and Commerce of Cotton in India and elsewhere. London. 1851.' A large compartment in our Museum is devoted to this material, with drawings of the plant: it contains

Cotton-pods, or ripe seed-vessels (generally still surrounded with the three-leaved involucre), more or less burst, and showing the cotton, which envelops the seeds; from various countries.

Nankin Cotton pod and *Nankin Cotton*, which is a variety naturally produced of that peculiar colour (not dyed, as is often supposed).

Raw Cotton. From the Southern States of North America, Mexico, South America, East Indies, Africa, etc., as labelled.

Cloth of various kinds, and in various states of preparation, chiefly the work of natives in extra-European countries.

A case is devoted to samples of *Egyptian*, *Macao*, *New Orleans*, *Surat* Cotton, from the bale; and cotton in various stages of manufacture, presented by Messrs. Dunn and Glover, of Manchester.

Another interesting case contains *Cotton-pods and seeds*, together with *Oil and Oil-cake* (for feeding cattle) extracted from the seeds, prepared and presented by R. Burn, Esq., of Edinburgh.

We are indebted to numerous other contributors for this extensive Collection of Cottons: viz. J. Hadwen, T. Bazley, W. Weston, J. Collings (*Maltese Cotton and Cloth*), D. Hanbury, Esqs., Dr. Seemann,

J. S. Fry, W. H. Benson, A. F. Ridgeway, J. Wetherell, H. Battock, Esqs., Sir James Brooke (*Dyak Cloth of Borneo*), Dr. Hooker (*Cotton Cloths from Bhootan, Sikkim; Purses from Soane River, etc.*), Dr. Wight, Dr. Inray (various kinds from Dominica), etc.

Ord. BOMBACEÆ. SILK COTTON-TREE FAMILY.

An Order nearly allied to the last, and included in it by Jussieu, possessing the same properties. They constitute large trees in tropical climates of the Old and New World, and are adorned with very large, handsome flowers. Trees, generally speaking, bear insignificant flowers: those of this Family are remarkable for their great size.

Baobab, or *Monkey Bread-fruit*. *Adansonia digitata*, L. Fruits and flowers, in liquid. Tropical Africa. These large fruits are the product of one of the most remarkable trees in the world, of which, and its flowers, there are drawings in the Museum. A trunk has been measured by Adanson on the coast of Senegal, thirty feet in diameter; the height of the tree however rarely exceeds eighty feet,—by no means corresponding with its thickness. The wood is pale, light-coloured, and soft, so that in Abyssinia the wild bees perforate and lodge their honey in the trunk, which honey is considered the best in the country. On the west coast of Africa the trunks are hollowed by the natives, and their dead deposited there, where they become mummies. They pulverize the leaves, which constitute *Lalo*, a favourite article, which they mix with their daily food, to diminish excessive perspiration, and which is even used by Europeans in fevers, diarrhœas, etc. The fruit is perhaps the most useful part of the tree: its pulp is acid and agreeable, and the juice, mixed with sugar, constitutes a drink that is deemed a specific in putrid and pestilential fevers, and is therefore an article of commerce. It seems to inhabit most of the tropical parts of Africa, and we have lately received the fruit, gathered by Lieutenant-Colonel Steele at the great interior Lake, Ngami.

Flower of Pachira alba, in liquid. Brazil. (Hort. Kew.)

Silk or Down and Fruit from the Bombax Mungha, Mart. Brazil. (Mr. Spruce.) Used for stuffing cushions: considered hotter than feathers.

Silk and Fruit from Eriodendron Samauma, Mart. Rio Solimões, Brazil. (Mr. Spruce.) The Silk Cotton used by the Indians of the Amazon for wrapping round the ends of the arrows which they use with the blowpipe, and also for stuffing cushions.

Silk Cotton from the East Indies. *Bombax* —? (E. I. C.)

Silk Cotton from *Bombax Ceiba*, L. British Guiana. (Mr. Ridgeway.) This kind of *Silk Cotton* has been exported to the United States, and used in the manufacture of hats.

Fruit of Bombax Buonopozense? Beauv. West Africa. (Mrs. Hutton.)

Down and Flower-buds of West-India-Cotton, from *Eriodendron anfractuosum*, DC. Jamaica. (Dr. Alexander.) Dr. M'Fadyen (*Flora of Jamaica*, vol. i. p. 93) gives a most interesting account of this tree. "It is of rapid growth, and is readily propagated from stakes or posts planted in the ground. A superb row of these trees, at Belvidere Pastures, St. Thomas-in-the-East, was established from posts fixed in the earth, in making a common rail-fence. Perhaps no tree in the world has a more lofty and imposing appearance, whether overtopping its humble companions in some woody district, or rising in solitary grandeur in some open plain. Even the untutored children of Africa are so struck with the majesty of its appearance, that they designate it the *God-tree*, and account it sacrilege to injure it with the axe. The large stems of this tree are hollowed out to form canoes. The wood is soft, and subject to the attack of insects; but if steeped in strong lime-water, it will last for several years, even when made into boards and shingles, and in situations exposed to the influence of the weather. The young leaves are sometimes dressed by the Negroes as a substitute for *Ochras* (*Hibiscus esculentus*, L.). The wool has been employed in stuffing mattresses, and it is said to answer the purpose equally well as feathers, but to be rather warm. The caterpillar of the *Macaca* beetle, considered by some, when gutted and fried, as a very great delicacy, is to be found in abundance in the decayed stems of this tree."

Cloth woven near Gowhatty, Assam, from the wool of the *Simool*, *Bombax heptaphyllum*, Cav. (Major Jenkins.)

Silk Cotton, and the pods which contain it. *Ochroma Lagopus*, L. Jamaica. (Dr. Alexander, H. Battcock, Esq.) Also used in the manufacture of hats.

Nest of the "Doctor Humming Bird," made of the silk cotton of *Ochroma Lagopus*, L. (H. Battcock, Esq.)

Durion or *Durian Fruit*. *Durio Zibethinus*, L. Malay Islands. Is considered one of the most delicious productions of nature: it is indeed foetid, and therefore disagreeable to those unaccustomed to it, but it universally becomes in the end a favourite article of the dessert. Cultivated extensively in the Eastern Archipelago, *Lindl.* It is how-

ever, according to Roxburgh, only the fleshy aril which envelopes the seed that is eaten.

Durion or *Durian Fruits of Ceylon*; from *Cullenia excelsa*, Wight;—*Durio Zeylanicus*, *Gardn.* (G. H. K. Thwaites, Esq.) Fruit not eatable. Monkeys are very fond of it.

Capsule of Durio Oxleyanus. East Indies. (W. Griffith, Esq.)

Capsules of Durio Ootau. Malacca. (Dr. Lemann.)

Fruit of Matisia cordata, H. B. K. New Granada. (Mr. Purdie.) Cultivated in Peru and New Granada on account of its fruit, which, according to Humboldt, is edible, and possesses a flavour like Apricots.

Hand-plant, flowers in liquid, *Cheirostemon platanoides*, H. B. K., from the Hort. Soc. of London. A sacred plant among the ancient Mexicans; considered so probably in consequence of the resemblance of the stigma of the flower to the human hand. At the time of Humboldt's visit to Mexico, only one tree was known, and that in a state of cultivation near the capital; now it is detected in its native woods.

Capsules of Neesia altissima, Bl. (Dr. Lemann and Dr. De Vriese.)

Fibrous bark of Hoheria populnea, A. Cunn. New Zealand. (Rev. W. Colenso.) The bark, like that of Mallows, affords a demulcent drink used in medicine, and a cordage, whence the native name (*Hoheria*), to *bind* or *tie*.

New Zealand Cotton, fibre of *Plagianthus urticinus*, A. Cunn. New Zealand. (Major Richmond.)

Ord. STERCULIACEÆ. STERCULIA FAMILY.

In many respects nearly allied to the two preceding and to the two following Families: all possessing the same properties, viz. abounding in fibre and mucilage.

Kola or *Cola Nuts.* *Sterculia acuminata*, *Beauv.* West coast of Africa; cultivated also in the West Indies, whither it was introduced by the slave-vessels, and even in Bahia. (J. Wetherell, Esq.) The nuts or seeds have a pleasant, bitter taste, and are much eaten and esteemed by the Negroes as a promoter of digestion: they also prevent sleep, and are used by the native watchmen to keep themselves awake. Powdered *Kola* is applied to wounds or cuts.

Kulheim; fibrous bark of a *Sterculia*. Sikkim Himalaya. (Dr. Hooker.) Used for making cordage, etc.

Oadal; fibrous bark of *Sterculia villosa*, Roxb. Eastern Bengal.

(Major Jenkins.) Of this is made fine pliable ropes, and especially those used by elephant hunters in the jungles. (Dr. Campbell.) See our vol. ii. p. 27, of this Work.

Bag made of the Bark of *Sterculia villosa*, Roxb. These bags are very quickly made, by steeping logs for a few days, and then stripping off the bark. They are much used for the conveyance of goods in the Goa territory and Canara, as the far superior bags made of *Antiaris saccidora* (*Lepurandra saccidora*, *Graham, Pl. of Bomb.*) are, further south.—See the bags of the latter, under *Artocarpæa*.

Wood of *Sterculia platanifolia*, L. fil. Japan. Cultivated; from the greenhouse of the Duke of Northumberland, Syon.

Gum Tragacanth, of *Sierra Leone*? *Sterculia Tragacantha*?, *Lindl.* (Messrs. Drew and Co.)

Gum of Sterculia Carthaginense, L. Venezuela. (M. Wagener.)

Gum Kuteera. *Sterculia urens*, Roxb. Bombay. A gum somewhat like Tragacanth, as a substitute for which a quantity of it was some years ago imported, but it was soon found that it was not either so soluble or so glutinous as Tragacanth, and its importation has therefore ceased. (*Gum Kuteera* is by Dr. Lindley referred to *Cochlospermum Gossypium*, in *Cistaceæ*.)

Fruit of Sterculia Balanghas, L. Malabar. (Hort. Kew.) Seeds wholesome, and when roasted nearly as palatable as chestnuts (*Roxb.*). In Amboyna the pericarp is burnt to make a pigment called *cassoumba*.

Woven Cloth from the fibre of *Sterculia* sp. Khasia. (Major Jenkins.) Worn by the Kuki chiefs.

Bottle-tree of Australia. *Delabechia australis*, *Lindl.* Interior of subtropical Australia. (Dr. Lindley.) (*Sterculia guttata*, *Roxb.*, and no doubt many other species of the genus, make excellent cordage.)

Ord. BYTTNERIACEÆ. CHOCOLATE FAMILY.

By Jussieu this Order is united with *Sterculiaceæ* and *Bombacæ*; it is peculiarly interesting, as including the Chocolate-tree.

Chocolate. *Theobroma Cacao*, L. Fruits and seeds; (the latter of which yield Chocolate and Cocoa), from Trinidad, Granada, Bahia, Nicaragua, Caracas, Pará, Guayaquil; shells of the *Nuts*, *Nibs*; numerous samples of prepared *Chocolate* and *Cocoa*;—a very fine collection, prepared and presented by Messrs. J. and S. Fry and Sons, of Bristol. An interesting case, with various preparations, is presented also by Mr. L. Monteiro,

and another by Mr. G. B. White. Fruits that have ripened in England (in the stove) have been presented by His Grace the Duke of Northumberland (from Syon), and by Dillwyn Llewelyn, Esq.

Cocoa-fat. (J. B. Collings, Esq.)

Coco-nuevo. Seeds. Antioquia. (W. R. Jervis, Esq.)

A large drawing in the Museum (besides the living plant in the Garden) will give an idea of the foliage, flowers, and recent fruit of the *Theobroma Cacao*; a native of South America. The fruit is large, and contains several large seeds, with a crustaceous shell or husk (*testa* or *integument* of the seed), imbedded in pulp. From the entire seed, including the husk, *Cacao* (or *Cocoa*, as it is generally called) is prepared:—from the seed, after the husk is removed, chocolate is prepared. The tree is most extensively cultivated in tropical America and the West India islands, and the exports of these two articles are very considerable, especially from the Island of Trinidad. It is made into a paste, and mixed with *Vanilla*, etc., and generally coloured with *Arnotto*, and dried in cakes in the form in which we see it in the shops.

Goorakhee Khorai Fibre, Rope, and Yarn, from *Theobroma augusta*, L. Assam. (Major Hannay.)

Fruit of Herrania pulcherrima, Goud. Peru. (Mrs. Parker.) Of botanical interest only.

Ord. TILIACEÆ. LINDEN OR LIME FAMILY.

A Natural Family again much allied to the four preceding groups, and possessing, like them, mucilaginous properties and abundant fibre in the inner bark; yielding many useful products to mankind.

Lime Flowers. *Tilia Europæa*, L. Europe. Antispasmodic. The infusion possesses a very agreeable taste.

“*Lime-tree Bark*,” from North-west America. (Dr. Gairdner.) Probably imported from the east side of the Rocky Mountains.

Bast, or *Russian Matting*. This is the inner bark of the *Tilia Europæa*, L., generally prepared in Russia. We possess however “English bast,” prepared and presented by J. Thorne, Esq., Mowbray House, South Lambeth.

Jute Fibre (T. Hancock, Esq.), and *Dowlas*, Carpets, and Gunny Cloth (for making rice-bags in India), made from *Corchorus capsularis*, L., and probably other species. (E. I. C., and W. Gourlie, Esq.)

Jute Paper. Five samples of as many excellent papers, recently

(1854) prepared at Madras, under the direction of, and presented by, Dr. Hunter; made from old Gunny bags.

Sabots de Filasse. Made in the South of France, from Jute and Cotton. (Dr. Alexander, J. Murray, Esq.)

Khook in Soota Fibre. "*Grewia sp.*" Assam. (Major Hannay.)

Gootee Fibre, Rope, and Yarn. *Triumfetta angulata*, L. Assam. (Major Hannay.)

Inner Bark, and Rope made therefrom. *Apeiba Petouma*, Aubl. (Dr. Seemann.)

Fruit of Apeiba aspera, Aubl. Tropical America.

Fruits of Sloanea Jamaicensis, Hook.

Rosaries used by Indian devotees, made of the seeds of *Elæocarpus Ganitrus*, Roxb. (Major Madden, Drs. Hooker and Wallich.) Often used as necklaces, and sold in London shops.

(To be continued.)

New PROTEACEÆ of Australia; by C. F. MEISNER.

(Continued from p. 78.)

38. *Hakea circumalata*, Nob.; ramis apice incano-tomentellis, foliis tereti-filiformibus indivisis uncialibus exsulcis lævibus glabris mucronatis basi haud attenuatis, floribus . . . , capsula solitaria terminali? breve crasseque stipitata compresso-subglobosa ventricosa sub acumine compresso bicalcarata, semine undique ala cincto, nucleo cristato-tuberculato alam terminalem acutam æquante lateralibus subduplo latiore.—*Drummond*, coll. vi. n. 192.

This is the same as No. 290 of *Drummond's* fourth collection, which I had with doubt referred to *H. rugosa*, R. Br., from which however Mr. Kippist informs me it is distinct. From *H. cycloptera*, R. Br., it appears to differ in having smooth branches, shorter leaves, and the capsule not gibbose.

39. *Hakea Meisneriana*, Kippist MSS.; glabra, foliis erectis tereti-filiformibus rectis mucronulatis undique subsulcatis basi attenuatis, floribus axillaribus breve subspicatis, ovario sessili, stigmate breviter exserto conico, capsula breve stipitata oblique ovata acuminata ecalcarata sublævi, semine parvo, nucleo ruguloso basi fere aptero utrinque anguste alato, ala terminali ipso subduplo majore obtusius-

cula.—*H. sulcata*, Meisn. in Pl. Preiss. ii. p. 260 (nec ib. i. p. 556, nec R. Br.), et in Hook. Journ. 1852, p. 208, ex parte.—*Drummond*, coll. iii. n. 272; v. Suppl. n. 16; vi. n. 191.

The true *H. sulcata*, Br., according to Mr. Kippist's examination of a specimen in the British Museum, gathered by the author himself, and to which the plant of Preiss (Pl. Preiss. i. p. 556) seems also to belong, differs from Drummond's specimens in having only five or six striæ (instead of ten) on the leaves, which are also broader at the base, and in the flowers being not spicate but merely fasciculate.

40. *Hakea Gilbertii*, Kippist MSS.; ramulis adpresse pubescentibus, foliis angulato-filiformibus indivisis undique paucisulcatis attenuato-mucronatis basi paullo dilatatis elevato-puncticulatis glabris, spicis axillaribus fasciculiformibus versus apicem ramorum dense congestis, floribus squamisque glaberrimis, ovario subsessili, stigmate breviter exserto conico, capsula parva ovata acuminata ecalcarata sparse tuberculata, seminis nucleo tuberculato utrinque anguste alato, ala terminali acutiuscula ipso paullo brevior.—About Perth, 1842.—*Gilbert*, n. 391.

Allied to *H. sulcata*, but differing in having the leaves smaller, thinner, and less dilated at the base, etc. The fruit is almost like that of *H. scoparia*, but smaller, scarcely half an inch long. I have not seen this species.

41. *Hakea Pampliniana*, Kippist in litt.; ramulis adpresse puberulis, foliis tereti-filiformibus indivisis pungentibus exsulcis curvatis basi haud attenuatis lævibus glabris, fasciculis axillaribus sessilibus, pedicellis calycibusque subæquilongis dense sericeis, pistillo sessili glabro calycem subduplo superante, stigmate obliquo conico-convexo, capsula . . .—About Adelaide (Herb. Linn. Soc. Lond. com. a Dom. Pamplin).

Allied to *H. epiglottis*, but the leaves are slightly thickened at the base. Flowers white, smelling like Iris. I have not seen the plant.

42. *Hakea Kippistiana*, Nob.; foliis teretibus indivisis mucronatis exsulcis ramulisque glabris, floribus . . ., capsula ovata gibbosa lævi apice subito compressa acuta brevissime bicalcarata, seminis ala nucleo vix duplo majore hinc secus ejus marginem obliquum late decurrente.—*Drummond*, coll. v. Suppl. n. 14.

From *H. tephrosperma*, R. Br., to which I formerly (Hook. Journ. 1852, p. 207) referred this plant, though with some doubt, it essen-

tially differs in the shape of the fruit and seed, and moreover in the locality.

43. *Hakea auriculata*, Nob.; ramulis minute puberulis, foliis rigidissimis planis glaucis glabris extra medium cuneato-obovatis subtruncatis spinoso-5-7-dentatis lobatisve immerse penniveniis, infra longe attenuatis linearibus 1-nerviis integerrimis, basi auriculato-dilatatis spinuloso-serratis, fasciculis axillaribus sessilibus paucifloris, calyce parvo incurvo rufo-tomentello, stigmate terminali rotundo convexo, capsula (fide Kippist) ovata dense subcylindrico-tuberculata sub apice bicalcarata, seminis ala nucleum subæquante. — *Drummond*, coll. vi. n. 197.

Allied to *H. prostrata* and *glabella*, but the flowers are smaller, the fruit and leaves differently shaped; the lamina of the latter is 8-12 lines long, and as broad, and sometimes quite entire, or only armed with one or two spinules, the petioliform part 1-2 lines broad.

44. *Hakea flabellifolia*, Nob.; ramulis apice parce puberulis, foliis rigidissimis obverse triangularibus rectilineo-cuneatis longioribus quam latis apice truncato serratis cæterum integerrimis venis tenuibus immersis dense flabellato-lineatis demum aveniis, dentibus muticis, sinibus semilunaribus, fasciculis axillaribus subsessilibus multifloris, calyce tenui inflexo rufo-sericeo pistillum glabrum subæquante, stigmate terminali brevi subconico, capsula . . — *Drummond*, coll. vi. n. 196.

Though very closely resembling *H. Brownii*, it differs from it in having the leaves smaller, constantly longer than broad, and their sides forming a straight (not arcuate) line. Moreover, Mr. Drummond says (Hook. Journ. 1853, p. 179) that it is altogether a smaller plant, with differently-shaped fruits from those of *H. Brownii*.

45. *Hakea florulenta*, Nob.; glaberrima, foliis elongato-lanceolatis obtusis apice sphacelato submuticis basi longe attenuatis obsolete nerviformi-marginatis lævibus immerse triplinerviis paucivenosis, fasciculis axillaribus subsessilibus multifloris, pedicellis calycem subæquantibus, stylo demum calycem breve superante, stigmate terminali obliquo discoideo convexo, capsula . . — About Moreton Bay. — Mr. Strange.

This approaches *H. saligna* and *Hookeriana*, but differs from the former in having blunt leaves, from the latter in the glabrous flowers, etc. Leaves 3-5 inches long, 6-10 lines broad.

46. *Hakea megalosperma*, Nob.; glabra, foliis rigidissimis sessilibus glaucescentibus oblongis obtusissimis muticis cum puncto sphacelato subexcentrico, basi attenuatis, immerse 1-nerviis obsolete impresso-venosis marginatisque, floribus . . . , capsula solitaria magna (sub-bipollicari) crasse pedunculata ovali acuta compressa, valvis extra medium leviter gibbosum crasse obtuseque carinatis, carina in calcar compresso-triangulari rectum obtusiusculum producta, semine magno oblongo circumcirca alato, nucleo subrugoso ala terminali $\frac{1}{3}$ brevior lateralibus æqualibus basilarique dimidio latiore.—Mount Lesneur.—*Drummond*, coll. vi. n. 194.

A very remarkable species, resembling *H. crassifolia* in the leaves, which are $1\frac{1}{2}$ –2 inches long, 7–10 lines broad, but they are horizontal (not vertical, as in that species), not quite so thick, nor oblique, with a somewhat different nervation.

47. *Hakea neurophylla*, Nob.; glabra, foliis sessilibus rigidissimis lanceolato- v. elliptico-oblongis integerrimis breve acuminatis sphacelato-mucronulatis basi breve attenuatis obsolete nervoso-marginatis utrinque prominulo-trinerviis laxequ reticulatis, fasciculis axillaribus sessilibus, pistillo sessili pedicello vix longiore, stigmati conico, capsula subsolitaria crasse pedunculata deflexa ovata ventricosa breve acuminata verruculosa ecalcarata, semine semiovato-lanceolato, nucleo ruguloso hinc aptero basi brevissime alato ala terminali obtusa hinc late decurrente prope basin sinu parvo excisa.—*Drummond*, coll. vi. n. 195.

Allied to *H. loranthifolia*, *crassinervia*, and *petiolaris*, but abundantly distinct. Leaves $1\frac{1}{2}$ – $2\frac{1}{2}$ inches long, 8–14 lines broad; capsule an inch or more in length.

48. *Hakea pycnoneura*, Nob.; ramis apice cano-tomentellis, foliis sessilibus horizontalibus rigidissimis elongato-linearibus integerrimis (plus minus falcatis) mucronatis glabris basi attenuatis utrinque crasse trinerviis aveniis v. venis nonnullis costæ parallelis striatis nervis lateralibus marginantibus, floribus . . . , capsulis pluribus in pedunculo communi brevi crasso fasciculatis ovatis subventricosis acutiusculis ecalcaratis sublævibus, semine oblongo (semipollicari) circumcirca alato, nucleo tuberculato alam terminalem æquante, alis lateralibus inæqualibus.—*Drummond*, coll. vi. n. 193.

Approaching *H. ulicina* and *fulcata*, but differing in the very strong nerves of the leaves, the size and form of the fruit and seed, etc. Leaves 5–7 inches long, 2–3 lines broad.

49. *Lambertia multiflora*, Lindl., Pl. Preiss. i. p. 579.—*Drummond*, coll. vi. n. 198.

Mr. Drummond seems (in Hook. Journ. 1853, p. 180) to consider this a distinct species, but our specimens at least show nothing to distinguish them from the well known Swan River plant.

50. *Banksia pinifolia*, Nob.; ramulis albido-tomentellis, foliis sparsis anguste linearibus integerrimis mucronulatis lævibus glabris 1-nerviis aveniis subtus leviter bisulcis marginibus arcute recurvis costæ contiguis, capitulo terminali sessili folia æquante globoso, calyce unciali, limbo subtereti unguibusque fulvo-sericeis, laminis apice villosis muticis, antheris brevissime apiculatis, stylo sesquiunciali adscendente glabro apice attenuato recurvo, stigmate continuo cylindraceo obtuso basi leviter incrassato.—*Drummond*, coll. vi. n. 199.

Very near *B. sphærocarpa* and *nutans*, but easily distinguished by its longer (2–3 inch. long) leaves, the larger capitule and flowers, etc.

51. *Banksia tricuspis*, Nob.; foliis sparsis breve petiolatis linearibus apice 3-cuspidulatis (passim simpliciter acutis) cæterum integerrimis aveniis ramisque glabris, supra leviter 1-sulcis, subtus subconcoloribus bisulcis marginibus revolutis, capitulo terminali sessili folia æquante cylindraceo-oblongo, squamis tomentosis, floribus infimis stylisque demum deflexis, calyce subpollicari, limbo 4-gono mutico unguibusque minute rufo-puberulis subsericeis basi intus imberbibus, stylo sesquipollicari adscendente glabro apice attenuato recurvo, stigmate parvo continuo ovato obtuso.—*Drummond*, coll. vi. n. 205.

From *B. spinulosa*, its nearest ally, this differs in having the leaves twice or three times as long (3–5 inches), not white beneath, the recurved margins entirely covering the inferior face, etc.

52. *Banksia Candolleana*, Nob.; ramis apice albido-tomentellis, foliis sparsis elongato-linearibus (subpedalibus 5–7 lin. latis) truncatis mucronulatis basi attenuatis ad costam usque pinnatipartitis, sinibus acutangulis, lobis ovato-triangularibus isoscelis mucronatis planis (marginibus haud recurvis), supra lævibus glabris aveniis, subtus elevato-trinerviis reticulatisque niveis v. subconcoloribus, capitulo terminali breve pedunculato foliis longe superato ovoideo (mediocri) squamis infimis subulatis erectis albido-tomentellis, calyce $\frac{2}{3}$ -pollicari, unguibus minute sericeo-puberulis, laminis glabris muticis diu co-hærentibus, stylo subpollicari arcuato glabro, stigmate subcontinuo conico-cylindrico sulcato basi attenuato.—*Drummond*, coll. vi. n. 201.

This seems to be nearly akin to *B. Caleyi*, Br., which we have not seen, but to differ from it in the size and form of the leaves, the glabrous stigma, etc. From *B. elegans*, which it also closely approaches, it differs in the more deeply pinnate leaves, smaller capitula and flowers, in the arcuate style, form of the stigma, etc.

53. *Banksia elegans*, Nob.; ramis apice albido-tomentellis, foliis sparsis elongato-linearibus (pedalibus) pinnatifidis lævibus glabris subconcoloribus, sinubus acutis, lobis late ovato-triangularibus subisocelis subincurvo-acuminatis muticis subtus obsolete 3-5-nerviis vix puncticulatis, capitulo terminali subsessili foliis longe superato ovato-globoso, squamis inferioribus subulatis brevi-villosis, calyce pollicari, unguibus minute puberulis, laminis obtusis glabris, stylo calycem æquante recto glabro, stigmate continuo attenuato-cylindrico sulcato. —*Drummond*, coll. vi. n. 200.

A very distinct species, the leaves resembling those of *B. speciosa*.

54. *Banksia Victoriae*, Nob.; ramis fulvo-tomentosis, foliis sparsis elongato-linearibus (6-10-pollicaribus) pinnatipartitis utrinque tomentosis subconcoloribus supra demum glabratis lævibus, sinubus acutis, lobis late ovato-triangularibus subisocelis muticis incurvo-acuminatis, supra aveniis, subtus anguste nervoso-marginatis 6-8-nerviis albido-punctatis, capitulo terminali sessili foliis superato ovato amplo, squamis infimis longe rufo-barbatis, calyce pollicari basi glabro, unguibus puberulis, laminis linearibus muticis dorso fulvo-villosis, stylo calycem superante arcuato glabro apice incrassato, stigmate medio leviter incrassato supra conico-cylindrico infra attenuato. —*Drummond*, coll. vi. n. 203.

A noble species, very near *B. speciosa*, but easily distinguished by the segments of the leaves being larger, flat, not white underneath, nor scrobiculate above, etc.

55. *Banksia Hookeriana*, Nob.; ramis rufo-tomentosis, foliis sparsis linearibus dense inciso-serratis (subsemipedalibus) truncatis mucronulatis basi attenuatis utrinque lævibus glabris concoloribus, sinubus obtusangulis acutis, dentibus scaleno-triangularibus acutis muticis rectilineis subaveniis latioribus quam longis, capitulo terminali subsessili folia subæquante ovato amplo, squamis infimis subulatis recurvis hirsutis, calyce pollicari, unguibus puberulis, laminis linearibus muticis fulvo-villosis, stylo sesquipollicari, arcuato glabro apice vix incrassato, stigmate fusiformi medio oblique subarticulato supra subulato obtuso sulcato. —*Drummond*, coll. vi. n. 202.

A very distinct species, with the capitula and flowers almost of *B. Victorice* and *prionotes*, but quite different in the leaves, which somewhat resemble those of *B. lævigata* and *attenuata*.

56. *Banksia Lindleyana*, Nob. ; foliis sparsis lanceolato-linearibus truncatis serrato-denticulatis basi longe attenuatis (3-5 poll. longis 3-4 lin. latis), supra lævibus immerse 1-nerviis aveniis ramulisque glabris, subtus concoloribus margine leviter recurvis obsolete transverse venosis reticulatis albido-punctatis, sinibus rotundatis, dentibus muticis, capitulo terminali sessili folia superante ovoideo basi sterili, squamis adpressis triangularibus acutis cano-tomentosis, calyce styloque subarcuato subæqualibus pollicaribus glaberrimis, limbo diu clauso acute 4-gono tenuiter multi-sulcato mutico, antheris conico-apiculatis, stigmate continuo cylindræo obtuso sulcato basi obsolete noduloso.—*Drummond*, coll. vi. n. 204.

In the leaves and glabrous flowers this has some resemblance to *B. cylindrostachya*, but otherwise it is quite distinct, as well as from every other species.

57. *Banksia Sceptrum*, Nob. ; ramis cinereo-tomentosis, foliis sparsis breve petiolatis oblongis (2-3 poll. longis 10-12 lin. latis) truncatis emarginatisve mucronulatis remote obtuseque repando-denticulatis basi breve attenuatis supra lævibus aveniis glabris, subtus immerse transverse striatis reticulatisque areolis albido-tomentosis, spica terminali spithamæa cylindrica crassa folia longe superante, calyce pollicari, unguibus villosis, laminis muticis flavo-sericeis, antheris conico-apiculatis, stylo sesquipollicari sigmoideo infra pilosiusculo, stigmate fusiformi obtuso 8-sulcato basi noduloso.—Sand plain, north of Hutt River.—*Drummond*, coll. vi. n. 206.

A fine species, allied to *B. occidentalis* and *cylindrostachya* in the long, massy flower-heads, and to *B. media* and *Baueri* in the leaves, but quite distinct from them all. Flowers pale yellow.

58. *Dryandra tridentata*, Nob. ; foliis cuneato-linearibus apice tridentatis (passim integerrimis v. 4-dentatis) dentibus mucronatis intermedio majore, supra aveniis lævibus glabris nitidis, subtus scrobiculatis incano-tomentellis, capitulis ramulos laterales breves terminantibus sessilibus foliis dense cinctis superatisque, squamis exterioribus e basi lanceolata tomentella setaceo-subulatis flores subæquantibus pilosiusculis, interioribus brevioribus, calyce subpollicari pubescente, laminis sericeo-villosiusculis, stylo exserto glabro superne sigmoideo, stigmate continuo cylindræo haud incrassato.—*Drummond*, coll. vi. n. 207.

At first sight this looks so like *D. carlinoides*, that it might be taken as a mere variation of the same; it is however essentially distinct in the calyx being pubescent, the style thicker, the stigma of the same colour (not dark), the leaves glabrous, or scarcely canescent underneath, with scarcely visible veins, and their margins very slightly, or not at all recurved.

59. *Dryandra vestita*, Kipp. in litt.; ramis tomentosis undique squamis subulatis villosis dense tectis, foliis subverticillatis linearibus acutis inciso-serratis basin versus integris, dentibus acutis scaleno-triangularibus, divergentibus, marginibus revolutis, supra aveniis lævibus glabris, subtus reticulatis tomentosis, capitulis ramulos breves terminantibus inter folia sessilibus, squamis lineari-subulatis longe fimbriatis, interioribus flores subæquantibus, calycis tubo basi extus tomentoso, limbo 4-gono mutico styloque subæquilongo glabro, stigmate subulato vix striato.—*Drummond*, coll. v. Suppl. n. 20.

The scales on the branches are spirally curved. Leaves 3–4 inches, their teeth 1–2 lines, the intervals between them 3–5 lines long, the margins in the spaces between the teeth nearly parallel to the midrib; the whorls separated by leafless intervals of 1–2 inches.

60. *Dryandra nana*, Nob.; caule simplici subdigitali adscendente apice dense folioso monocephalo, foliis petiolatis pinnatis (3–5-uncialibus) sinibus latis rectilineis, lobis patentibus linearibus pungenti-acutis planis (margine haud recurvis), supra aveniis lævibus glabris, subtus 1-nerviis scrobiculatis tomentellis subconcoloribus, terminali proximis subæquali, capitulo sessili foliis superato, squamis subulatis pilosis flore dimidio brevioribus, calyce pollicari semi-4-fido, tubo incano supra basin glabram densius tomentoso 4-gono, limbo diu clauso obtuso parce ferrugineo-puberulo, stylo bipollicari inferne pilosiusculo supra attenuato recurvo glabro (amethystino), stigmate crasso conico infra basin annulatam turbinato.—*Drummond*, coll. vi. n. 210.

A most distinct species, allied to *D. arctotidis*, and chiefly remarkable for its dwarf growth, its only half-split calyx, and the uncommon length of the style.

61. *Dryandra tortifolia*, Kipp. in litt.; nana, caulibus squamosis apice ramosis, foliis pinnatis petiolatis caule multo longioribus supra glabris, lobis lanceolatis obtusiusculis aversis tortisve, subtus foreolatis tomentellis grosse 1-nerviis (nervulo altero interdum accedente) marginibus revolutis crassiusculis, capitulo terminali sessili, squamis ex-

terioribus foliaceis subulatisque, interioribus lineari-oblongis ciliatis flore dimidio brevioribus, calyce subsesquipollicari villosa, tubo semi-4-fido infra glabro, stylo subbipollicari glabro 1-sulco, stigmati brevi conico-cylindrico basi oblique incrassato.—*Drummond*, coll. vi. n. 211.

This is perhaps a mere variety of *D. aretotidis*, with which it agrees almost in every point, except in having the lobes of the leaves a little shorter, broader at the base, always more or less turned so as to have their upper face horizontal, and constantly marked with a rather strong nerve underneath, sometimes accompanied with one or two very thin ones; the flowers, besides, are a trifle larger, and the style and stigma thicker.

62. *Dryandra stenoprion*, Nob.; caule repente? ramis adscendentibus brevibus, foliis subverticillatis petiolatis pedibus dense serrato-pinnatifidis acutis, lobis semipatentibus scaleno-triangularibus acutis muticis supra convexis lævibus glabris, subtus margine recurvo concavis cano-tomentosis obsolete nervosis, sinibus acutangulis angustis inferioribus latioribus, capitulo . . .—*Drummond*, coll. vi. n. 212.

Although we have only seen a sterile specimen, we can scarcely doubt of its being a new species, closely allied to *D. Brownii*, *nivea*, and *Lindleyana*, but differing from them in having much narrower segments of the leaves, etc.

63. *Dryandra Shuttleworthiana*, Nob.; ramulis gracilibus apice cano-tomentellis, foliis sparsis sessilibus linearibus serrato-pinnatifidis truncatis apiculatisve (2–4-pollicaribus) supra lævibus glabris, subtus fortiter 1-nerviis aveniis albido-tomentosis, marginibus recurvis, lobis scaleno-triangularibus rectilineis muticis sinibusque acutis, capitulis lateralibus congregatis subsessilibus, squamis acuminatis interioribus patentissimis plumosis flore sublongioribus, calyce subpollicari angustissimo supra basin glabram sublanato supra glaberrimo, laminis ungue vix latioribus subulatis ultra antheras longe productis, stylo calycem æquante glabro, stigmati continuo concolori subulato.—*Drummond*, coll. vi. n. 208.

This resembles *D. elegans* and *Kippistiana** in the leaves, but differs

* We now call *D. Kippistiana* the plant of Drummond, coll. ii. n. 343, which we formerly referred to *D. foliolata*, R. Br. (see Hook. Journ. 1852, p. 210), from which it was found by Mr. Kippist to differ, at least according to the specimens of the British Museum. On the same authority Mr. Kippist thinks our *D. elegans* (*l. c.* p. 211, Drummond, iv. n. 317) identical with *D. tenuifolia*, R. Br., but we cannot agree with this opinion, finding the latter decidedly distinct by much longer petioles, more distant lobes of the leaves, their margins less strongly revolute, the whole leaves not stiff and straight, etc.

from the former in their being shorter, sessile, serrated to the very base, etc., and from the latter in the inflorescence, involucre, and calyx.

64. *Dryandra sclerophylla*, Nob.; ramis glabris, foliis sparsis (axillari-busque fasciculatis) subsessilibus rigidissimis (2-pollicaribus) linearibus dense serrato-pinnatis truncatis apiculatis basi attenuatis integris, lobis scaleno-triangularibus patentibus rectis sinubusque acutis, supra convexis lævibus glabris, subtus margine recurvo concavis cano-tomentosis plurinerviis obsolete reticulatis, capitulis terminalibus corymbosis subsessilibus foliis circumvallatis superatisque, squamis exterioribus folio terminatis, interioribus e basi ovata setaceo-acuminatis, calyce stylum basi pilosiusculum æquante ($\frac{3}{4}$ -pollicari) tenuissimo, unguibus patulo-pilosiusculis, laminis lanceolatis flavo-sericeis glabrescentibus, stigmatе conico-cylindrico basi subnoduloso.—*Drummond*, coll. vi. n. 209.

This also is very much like *D. Kippistiana*, and also *D. serratuloides*, in the leaves, but very distinct from both in other respects, especially in the calyx and style.

65. *Dryandra ferruginea*, Kipp. in litt.; caulibus abbreviatis, ramulis dense imbricato-squamatis junioribus tomentosis, foliis linearibus subpedalibus extra medium remote pinnatifidis acutis margine revolutis subtus ferrugineo-tomentosis supra lævibus glabris, lobis erecto-patentibus decurrentibus triangularibus acutis subtus obsolete 1-nerviis, capitulis terminalibus subsessilibus magnis ovatis, squamis glabriusculis, exterioribus ovatis albo-ciliatis, interioribus longioribus, intimis (2-3-pollicaribus) linearibus obtusis apice fulvo-tomentosis, calycis tubo supra basin incrassato marginibus ciliato, unguibus laminisque longe linearibus glaberrimis, stylo calycem breve superante basi puberulo, stigmatе cylindrico sulcato.—*Drummond*, coll. v. n. 416. Allied to *D. proteoides* and *tenuifolia*, but abundantly distinct.

66. *Dryandra serratuloides*, Nob.; ramulis gracilibus cano-tomentellis, foliis sparsis breve petiolatis lanceolatis pinnatipartitis (subbipollicaribus) acutis, lobis semipatentibus linearibus attenuatis sinubusque acutis, supra lævibus glabris, subtus obsolete 1-nerviis punctato-scribiculatis cano-tomentosis, marginibus haud v. vix recurvis, capitulis lateralibus dense approximatis (ramulos brevissimos apice foliosos terminantibus) parvis, squamis exterioribus ovatis apice sericeis, interioribus majoribus subulato-acuminatis mox glabratibus, calyce semipollicari basi glabro, unguibus laminisque albido-sericeis, stylo pol-

licari tenui inferne villosiusculo basi comoso, stigmatе continuo subulato basi obsolete incrassato.—*Drummond*, coll. vi. n. 213.

This resembles *D. armata* in the leaves, but it is essentially distinct from it in having shorter flowers, a thicker stigma, the inner squamæ of the involucre not lingulate, etc., and moreover, the leaves are petiolate, thinner, their segments narrower, and less pungent. Mr. Drummond appears to refer this species to *Hemiclidia* (Hook. Journ. 1853, p. 182). We have not seen the fruit.

On Enkyanthus Himalaicus and Cassiope selaginoides, two new Species of Himalayan Ericæ; by Drs. J. D. HOOKER and T. THOMSON, with two Plates (III. and IV.).

The history of the genus *Enkyanthus* being very incomplete, we have taken the present opportunity of figuring a hitherto undescribed species, which possesses the further interest of being the first and only one that has been found beyond the Chinese dominions, and the only second species known of the genus to exist.

Enkyanthus was founded by Loureiro (Flora Cochinchinensis, vol. i. p. 276) on two Chinese plants, of one of which, *E. biflorus*, nothing is known but the description; whilst the other, *E. quinqueflorus*, has long been in cultivation in England, but, from the absence of fruit, has not hitherto been referred to its proper position amongst *Ericæ*. Thus De Candolle places it at the end of the Order, and Endlicher, following Loureiro's description (in which he ascribes a berry to the genus), places it next to *Arbutus*. De Candolle indeed says, "Fructus ex Lour. et ex ic. Chinensi Londini servata, teste Benth., baccatus, ex Lindl. capsularis;" and this opens a question as to whether the two species of Loureiro may be congeners, which a comparison of his specific characters renders still more doubtful. That the *E. quinqueflorus* of our gardens is the type of Loureiro's genus, so far as the inflorescence is concerned, cannot be doubted, both from his description, and from the fact mentioned in the 'Botanical Magazine,' of a Chinese drawing of it, bearing the name *Tsian-tsung*, attributed to it by Loureiro; and that this plant has a capsular fruit (as stated by Lindley) is proved by Champion's specimen in the Hookerian Herbarium. The *E. biflorus* of Loureiro, again, described as having small, crowded, pilose leaves, a pilose calyx,

a corolla with an angled tube and five ovate, large laciniae, ovate incumbent anthers, a very pilose germen, a style longer than the corolla, and a thick quinquefid spreading stigma, can hardly be a congener of *E. quinqueflorus*, whether or no the fruit be, as Loureiro doubtfully suggests (from the immature specimen), a berry with many extremely minute rounded seeds.

The following is a description of the Himalayan species:—

1. *Enkyanthus Himalaicus*, Hook. fil. et Thoms.; frutex v. arbuscula, foliis ad apices ramulorum fasciculatis deciduis membranaceis petiolatis ovatis acuminatis serrulatis pubescentibus demum glabratis, floribus versus apices ramulorum corymboso-congestis pendulis v. nutantibus, pedunculis 1-2-floris, corolla late campanulata basi æquali, antheris longe aristatis, capsulis ex apice pedunculi erecti pendulis late ovatis pentagonis loculicide 5-valvibus, valvis margine incrassatis, seminibus lineari-oblongis, testa 5-alata, alis membranaceis undulatis, embryo filiformi. (TAB. III.)

HAB. In Himalaya orientali temperata; vallibus humidis Sikkim, alt. 8-10,000 ped. *J. D. Hooker*. Fl. May; fr. October.

Frutex 8-20-pedalis, vage ramosus, ramis gracilibus teretibus nudis; ramulis lateralibus ad apicem tantum foliiferis. *Folia* congesta, $1\frac{1}{2}$ - $2\frac{1}{2}$ unc. longa, petiolo gracili, læte viridia, juniora rubra, gemmis perulatis parvis vernatione tecta; *petiolo* lævi v. superne tuberculato; folia bractæformia propria nulla. *Pedunculi* 6-10, axillares, nutantes v. penduli, ob folia congesta quasi terminales, umbellam spuriam formantes, unciales, glaberrimi v. puberuli. *Sepala* parva, lanceolato-subulata. *Corolla* pallida, rubro et albo variegata, tubo lato basi obscure 5-gono et bullato, lobis parvis patentibus. *Stamina* 10, alterna paullo breviora; filamentis pubescentibus basi incrassatis. *Ovarium* 5-gonum, pubescens; stylo gracili, stigmatibus simplicibus. *Ovula* plurima, e placenta crassa apicem versus loculi axi adnata pendula, anatropa. *Capsula* $\frac{1}{3}$ unc. longa, valvis coriaceis ad medium solutis. *Semina* pallida.

This is by no means so handsome a plant as the *E. quinqueflorus*, from its scanty, paler green, deciduous foliage, the absence of any proper scarlet floral leaves, and the smaller and paler flowers. It further differs from that plant in the pendulous fruit; the capsules in *E. quinqueflorus*, which are of exactly the same structure, being erect. It is not an uncommon Sikkim plant in the central regions of that country,

but is not found on the outer ranges. The only other supposed species of the genus are *E. reticulatus*, Lindley, Bot. Reg. 885, which is referred by Benthams to *E. quinqueflorus*, and the *E. uniflorus* of Benthams (in the Florula Hongkongensis), which he himself has since shown to be founded on error. The position of the genus is in the section *Andromedæ* of De Candolle, where it will rank near *Andromeda* itself.

Plate III. *Enkianthus Himalaicus*. Fig. 1, calyx, stamens, etc.; 2, stamen; 3, pistil; 4, vertical section of an ovary; 5, capsule; 6, seed; 7, vertical section of the same:—*all but 5 magnified*.

We take the same opportunity of adding a figure and description of another very interesting and closely allied Ericaceous plant, from the same part of the Himalaya.

Cassiope selaginoides, Hook. fil. et Thoms.; caulibus gracilibus tetragonis subfastigiatis ramosis, foliis arcte quadrifariam imbricatis ovato-lanceolatis cymbiformibus acutis aristatisve marginibus fimbriato-ciliatis antice concavis dorso convexis medio longitudinaliter sulcatis, pedicellis lateralibus pubescentibus tomentosisque basi bracteis lanceolato-subulatis suffultis, floribus pentameris, capsula parva depresso globosa calyce vix longiore. (TAB. IV.)

HAB. In Himalaya orientali alpina; Sikkim, alt. 10–13,000 ped. *J. D. Hooker*. Fl. May, June.

Cæspitosa. Caules 3–8 unc. longi, graciles, cum foliis $\frac{1}{8}$ unc. lati. Folia 1–1 $\frac{1}{2}$ lin. longa, dorso valde convexa, in sulco pubescentia. Pedicelli graciles, unciales, apice curvi. Flos cernuus, $\frac{1}{3}$ unc. longus, albus. Corolla late campanulata. Filamenta dorso barbata. Antherarum aristæ puberulæ, horizontales. Capsula erecta, $\frac{1}{8}$ unc. diametro. Semina minima, curva, nitida, pallida, fusiformia.

This pretty little species is closely allied to the *C. lycopodioides* of Kamtschatka, differing in the form of the leaves; also to the *C. ericoides* of Siberia, which has tetramerous flowers and setose leaves, as also to others of the same section. From the common Himalayan *C. fastigiata*, which grows along with it, and abounds at elevations of 10–13,000 feet from Bhotan to Kashmir, it differs in size and many other points.

Plate IV. *Cassiope selaginoides*. Fig. 1, back, and 2, front view of a leaf; 3, flower, pedicel and bracts; 4, stamen; 5, pistil:—*all magnified*.

BOTANICAL INFORMATION.

*Note on the Vegetation of Rangoon, in a Letter from DR. M'CLELLAND,
dated May 31, 1854.*

I have lately been chiefly occupied in devising a tariff for the regulation of the future trade in Teak timber, together with forest rules. The forests I visited occupy the southern extremities of the range of hills which run southward from the centre of Burmah proper into Pegu, terminating about sixty miles north of Rangoon, where they spread out into a hilly tract between the Irawaddi and Sitang Rivers, and are intersected by numerous minor streams in every direction, by means of which the timber is floated to Rangoon. The chief peculiarity of the country is the slight inclination or fall of the river; so that tides extend probably in some cases eighty to one hundred miles in the interior, and indeed up almost to the foot of the hills where teak grows. They are however found of small size long before you arrive at the principal forests, which are invariably at an elevation of a few hundred feet from the beds of the streams, and always at their extreme or remotest tributaries, where they are confined to hot sheltered southern declivities, never found on northern slopes. It is this peculiarity which appears to me to account for the limited extent to which Teak occurs in any one place, more especially in a hilly country. The lower and more accessible forests have been very much exhausted, so that little large or full-grown timber is to be found, except in places where the expense of removal will be considerable. The remedy for this will of course be the preservation of the lower forests and especially of undersized timber.

Rattans, and two species of *Licuala*, with *Melica latifolia*, etc., one or two species of *Polypodium* and *Ophioglossum*, form the low vegetation along the course of the streams, with *Bombax*, *Dalbergia*, *Ficus*, *Sterculia*, *Grewia*, *Lagerstræmia*, etc., Teak being entirely absent. It is only when we ascend a few hundred feet that we find it, confined, as already observed, to the southern aspect of the hills, and associated always with *Blackwellia*, *Pentaptera*, *Inga*, *Xylocarpa*, *Dalbergia*, etc., with little underwood; the little there is being composed of two or three species of *Leea*, *Ardisia solanacea*, *Hibiscus Lampas*, *Connarus nitida*, with the following annuals:—*Justicia*, *Strobilanthus scaber*, *Dracæna*

maculata, *Eranthemum*, and *Urena lobata*. But where cutting has taken place, and the timber has been extensively removed, dense thickets of Bamboos spring up. Indeed, every place not occupied by large trees is covered with Bamboos of various kinds, from the dwarf China Bamboo to the huge gigantic kind peculiar to Burmah. The hills on which the largest timber grows are composed of indurated slates, dark bituminous or basaltic sandstone, which is covered along the base of the hilly country with laterite; and this is likewise clothed with forest, the timber of which is of smaller size. Beyond the laterite are the low plains, mostly covered with high grass jungle, and formed of river deposits resting on laterite. It is here alone where we find any population; for the only inhabitants of the forests are a few Kareens, who have no fixed habitation.

NOTICES OF BOOKS.

DOZY, F., et J. H. MOLKENBOER: *Bryologia Javanica*. 4to. 1854.
Fasc. III. cum Tabulis V.

We have just received the fifth fasciculus of this important work, the continuation of which will, we know, not be interrupted by the recent lamented death of one of its editors, Dr. Molkenboer. The whole of the five plates of the present number is devoted to the illustration of the species of the beautiful genus *Leucobryum* (to which belongs our *Dicranum glaucum*), of which eight species are described. *Cladopodanthus*, *Schistomitrium*, and *Spirula*, three new genera, and *Leucophanes*, follow next, and their plates will doubtless be given in the succeeding number.

PACKER, JAMES J.: *List of BRITISH MOSSES*.

Mr. James J. Packer, of Thirsk, has just published a classified "*List of British Mosses*," compiled from Wilson's '*Bryologia Britannica*.' It may be had at a very small expense, and by post, by applying to the author. This Catalogue is prepared in two forms: 1, as "copies for marking off desiderata or registering the species of a district;" and, 2, "on thicker paper, printed on one side only, to be used as labels."



Kew Garden Museum; or, an Account of the Origin and some of the Contents of the MUSEUM OF ECONOMIC BOTANY attached to the ROYAL GARDENS OF KEW; by the Director, SIR W. J. HOOKER, K.H., F.R., A., and L.S.

(Continued from p. 114.)

Ord. DIPTEROCARPEÆ. MALAY-CAMPHOR FAMILY.

A Family of stately forest-trees, chiefly inhabiting the Indian Archipelago, yielding a peculiar resin (generally called *Dammar*), of which the most remarkable is the article we shall first notice.

Borneo or Sumatran Camphor. In its raw or natural state, this is found deposited in crystals in the decayed and hollow interior of the trunks of *Dryobalanops Camphora*. This was spoken of by the celebrated traveller Marco Polo, before the year 1299, as "*Canfara Fansuri*," or Camphor of the kingdom of Fansur, in Sumatra; and Camoens, 272 years later (viz. in 1571), sings, as related at p. 200 of the fourth volume of this Journal,

"Bornéo here expands her ample breast,
By Nature's hands in woods of *Camphire* drest:
The precious liquid weeping from the trees
Glow's warm *with health*, the balsam of disease."

LUSIAD, transl. by Mickle.

Our readers will find a full history of the tree (for, long as it has been known to travellers, it is only of late years that its botanical character, and even its true properties, have been described) in this Journal, vol. iv. p. 33, by Dr. De Vriese; at p. 200 by ourselves, from information communicated from Borneo by Mr. Motley, with a figure of the plant and crystals *in situ*, at Tabs. VII. and VIII.; and we shall here merely observe that the camphor is, and always has been, a very costly article, often as high as thirty-five dollars the catty. It is principally used for embalming the dead. Our Museum contains noble specimens *in situ* of

Kassar Barnes, as it is called in Borneo, the crystallized Camphor naturally secreted in the hollow trunk of *Dryobalanops Camphora*, Colebr.

Minak Kassar, or *Camphor-oil* of the same.

Leaves and unripe fruit of Dryobalanops Camphora, Colebr., in liquid.

White resin of the same.

Fossil wood, almost partaking of the nature of coal, containing resin : considered to be fossilized *Dryobalanops Camphora*.

(All the above valuable collection sent from Borneo, and presented by J. Motley, Esq.)

Camphor and *Oil of Dryobalanops Camphora*, Colebr., from Sumatra. (Dr. W. H. De Vriese.)

Gum Piney (called also *Copal* in India, Dr. Roxburgh, and *Dammar* by the English) ; a resin from *Vateria Indica*, Gærtn. Malabar and Ceylon. (E. I. C., D. Hanbury, and G. H. K. Thwaites, Esq.) From this tree exudes the resin called Piney (Pacnoc or Peini) resin, of which in India the Piney varnish is made (see Roxb. Fl. Ind. vol. ii. p. 604). It effectually resists the action of water. Beads are made of it, exactly resembling amber beads, and, like that substance too, it is electric when rubbed.

Resin and bark of Dipterocarpus turbinatus, Gærtn. Eastern Bengal (and Ceylon?). (G. H. K. Thwaites, Esq.) This tree, Dr. Roxburgh says, is famous all over the eastern parts of India and the Malay Islands, on account of its yielding a liquid balsam, commonly called *wood-oil*, which is much used for painting ships, houses, etc. After long exposure to the air it concretes into a resin.

Indian Balsam of Copaiba, essential oil of the last-mentioned tree, *Dipterocarpus turbinatus*, Gærtn. ; prepared by J. Gordon, analytical chemist, Calcutta.

Resin of an unknown *Dipterocarpus* (?) from India. (E. I. C.)

Doon, or *Doon-gaba* (Doon-tree) *resin*, from *Doona Zeylanica*, Thwaites in Kew Gard. Miscel., vol. iv. p. 7, and vol. iii. Tab. XII. Ceylon. (E. I. C., and G. H. K. Thwaites, Esq.) Mr. Thwaites says, "This is a fine forest-tree, very abundant in some parts of the central province of Ceylon, especially on the crests of the hills. The timber is much esteemed for building purposes, and the resin, which exudes in considerable quantities from any wounded part of the tree, is sometimes used by the natives for burning in their houses, being first mixed with husks of paddy (rice) : it is soluble in spirits of wine, and makes an excellent varnish."

Resin of Doona Gardneri, Thw. Ceylon. (G. H. K. Thwaites, Esq.)

Ord. TERNSTREMIACEÆ. TEA FAMILY.

As including the *Tea-plant*, the present Natural Order may unques-

tionably be considered one of very high importance, affording to millions of all nations the drink

“that cheers, but not inebriates.”

Volumes might be, and have been, written on its history. We shall here merely observe that, botanically, two species of Tea are acknowledged natives of China, *Thea viridis* (Green Tea), and *Thea Bohea* (Black Tea); but travellers, and especially Mr. Fortune, have ascertained that Black and Green Teas of commerce may be made from either or both species, according to the modes of preparation. Linschot is said to be the first traveller who (about A.D. 1590) speaks of this “herb,” with which the Japanese prepare a drink, and which they offer to their guests as a mark of high consideration. Caspar Bauhin (about 1623) mentions it in his “Pinax” under the name of *Cha*. It was very early in the seventeenth century that Tea first became known in Europe; and we are assured that the Dutch at first carried on the trade, by recommending the Sage of Europe, which they gave in exchange for the Tea of China. Lords Arlington and Ossory brought home a quantity of Tea from Holland about the year 1666, at which time it sold for sixty shillings per pound, though the practice of Tea-drinking in public coffee-houses was not uncommon in London prior to that period; for in 1660 a duty of 8*z*. per gallon was laid on the liquor made and sold in all coffee-houses. About a century and a half ago, according to Lord Macartney, the English East India Company did not sell more than 50,000 lbs. of Tea annually, and very little was smuggled. In 1784, the consumption of Great Britain was 1,333,814 lbs.:—now that of Great Britain and Ireland, exclusive of the dependencies (1852), amounts, according to the Tea Reports, to 54,724,000 lbs.

Russia is considered to rank next to Great Britain in its consumption of Tea. Its trade is however, owing to the proximity of a large portion of her dominions, by land. In Asiatic Russia, and still more in Tibet, a peculiar Tea is drunk, under the name of Brick-tea, so called because it is formed into masses or cubes. It is said to be made at Fo-kien, and consists of old or coarse damaged leaves and stalks, pressed into moulds, generally with a little bullock’s blood, and dried in the sun. It is bruised in a mortar, and boiled down with salt and oil, and sometimes milk, and thickened with flour.

The collection of Chinese Teas in the Museum is a very valuable one; consisting of

Samples of *various sorts of ordinary, but good, Teas of commerce*, presented by Messrs. Twining. These are—**BLACK TEA**:—*Congou* (three qualities), *Souchong*, *Plain Caper*, *Chulan Caper*, *Orange Pekoe*, *Scented Pekoe*, *Flowery Pekoe*, *Assam Souchong*, and *Assam Pekoe*. **GREEN TEA**:—*Twankay*, *Hyson* (two qualities), *Young Hyson* or *Pontazan* (two qualities), *Imperial*, and *Gunpowder Hyson*.

Large and small Black Ball Tea. These are made into balls: those of a small size are sold enveloped in paper made of Bamboo; those of larger size (about as large as a child's playing-ball) are enveloped in the flowering sheaths of the Indian corn, *Zea Mays*, L., to preserve the aroma the better. (J. Reeves, Esq.)

Old Man's Eyebrow Tea. This is done up in short twisted sticks, and perhaps bears allusion to the legend of some Chinese saint tearing off his eyebrows, and throwing them upon the ground, where they sprouted out into tea-plants; and representations of this wonderful transformation are not uncommon on Chinese screens, etc.

Brick Tea, of which mention is made above (J. Reeves, Esq.); and very fine samples brought by Dr. Hooker from Tibet, together with the coarse tea-pots from Shigatzi, used by the Tibetans for preparing the beverage from it. The Tibetans Dr. Hooker met with in Eastern Nepal prepare a soup from the Brick-tea, of which a handful of leaves is churned up with salt, butter, and soda, then boiled and transferred to the tea-pots, whence it is poured scalding hot into each cup, which the good woman of the house keeps incessantly replenishing and urging you to drain.

Wheatsheaf Tea. Made in sticks, or long pieces, and tied up in bundles like small sheaves. (J. Reeves, Esq.)

Tea made expressly for the Emperor of China, presumed to be super-excellent. (Captain Pidding.)

Assam Tea, from the Assam Tea Company. Six samples made from the indigenous Assam plant, and six from the Chinese plant grown in Assam, consisting of the following kinds, viz. *Hyson* (three qualities), *Congou* (first class), *Souchong* (first class), and *Flowery Pekoe*.

Kamaoun Tea, green and black. (A. Leach, Esq.) This and the last are made in the East India Company's possessions, and command an extensive and an increasing sale.

"*Medicated Tea*," from Chinese Tartary. (Her Grace the Duchess of Northumberland.) Probably the *Pu-erh* tea mentioned by De Guignes;

according to Fortune prepared from various herbs and used for medical purposes.

Teas from Chittagong ; made there from the Assam and Chinese plants. (Dr. Hooker.) It may be here observed that the Tea-plant of Assam is considered a native of that country, a larger and coarser plant than the Chinese, and a distinct species, *Thea Assamica*, Royle.

Paper Tea. (J. Reeves, Esq.)

Yellow Tea, from the great Russian fair of Nijni Novogorod. (G. Benthams, Esq.)

Atkalah Tea, and Tea from Yarkand. Captain Strachey. Probably Chinese Teas made for those markets.

"*Extract of Tea.*" (Dr. Murchison.) A preparation (not a *true* extract) of Tea, made into lozenges of a variety of forms and sizes, and stamped with different devices ; used by the Chinese while on long journeys. One of the lozenges being put into the mouth is allowed to gradually dissolve. Our specimens were brought from Pekin in 1812, and still retain the Tea flavour in perfection.

Chinese Tea-cup, of elegant make. Mrs. Bates.

Tea-seeds. (R. Howard, Esq.)

Theine, the principle of Tea (which exists also in Coffee and other plants.) (Dr. Stenhouse.)

Flowers of Tea. (J. Reeves, Esq.)

A case containing samples of the various *ingredients* employed in the manufacture of *Green Tea* by the Chinese, brought from Canton by Dr. Seemann, and described by him in his 'Voyage of H.M.S. Herald.' These are *Turmeric*, *Gypsum*, and *Prussian blue*.

Samples of various *spurious Teas* manufactured and sold in England, and also of adulterated Chinese Teas. The number is very considerable, and the substitutes very trashy, to say the best of them. (Arthur Hassall, Esq.)

The Museum contains an elaborate series of Chinese drawings, which there is at present no room to exhibit, explaining the origin and *cultivation* and *manufacturing of Tea*, all done on rice-paper. The first drawing represents a monkey upon a rock gathering the Tea-plant, and showering down specimens on the gaping Chinamen below.

Closely allied botanically to the Teas (*Thea*) are the *Camellias*. Of these floral favourites we possess :—

Flowering specimens of Camellia Japonica, L., modelled in wax, and

presented by Mrs. Chipperfield and Mrs. Temple. (These are in room No. 1, under shades, apart from the Tea collection.)

Fruits of Camellia Japonica, L., ripened in England.

Tea Oil, as it is called, extracted in China from *Camellia Sasanqua*, L., and used by the Chinese for the same purposes as Olive oil in Europe.

Seeds of Camellia Sasanqua, L. China. This and the last presented by R. B. Jackson, Esq. Other samples are brought by Dr. Hooker from Chittagong.

Bark and wood of the Caraipé, or Pottery Tree, from Pará. *Caraipa angustifolia*, (?) Aubl. (Captain Sir Everard Home, Mr. Spruce, Mr. Wallace.)

Burnt Bark of the same, preparatory to its being made into pottery ware. (Mr. Spruce.)

Specimens of the Pottery ware prepared from the bark of the *Caraipa angustifolia*, Aubl. Pará. (Captain Sir Everard Home, Mr. Spruce.)

The *Caraipé* or *Pottery Tree* of French Guiana was first brought into notice by Aublet, who called it *Caraipa angustifolia*, and of which he says, "Les Gucripons employent les cendres de son écorce, mêlées avec une terre grasse, pour leur poterie." The plant of Pará accords with this in properties, and the natives give it the same name of "*Caraipé*;" but although specimens of the foliage sent by Mr. Wallace for the plant agree sufficiently well with Aublet's figure, yet others, sent by Mr. Spruce, the latter botanist is disposed to consider a *Chrysobalanaceae* plant, and probably a *Parinarium*. It forms a lofty tree, one hundred feet high before it sends forth a branch, with a diameter at the base of the stem of not more than twelve to fifteen inches. "The wood is so hard," says Mr. Spruce, "that our tools would not touch it. It may be said the same of the bark, owing to the presence of a great quantity of earthy matter, so that if applied to the teeth it gives almost the sensation of stone. Still it is not the bark alone that is used. Clay is necessary, and the purest clay is preferred, because it takes up the greatest quantity of bark; this quality of clay is procured from the beds of the rivers and Igaripés. The accompanying specimens were made for me by an Indian woman, residing on the Igaripé Castanhal, at Tanaú, and consist of nearly equal portions of clay and the powdered and burnt bark of the *Caraipé*. They will bear almost any amount of heat. The two 'panelas' are used for heating milk, boiling eggs, and similar

purposes; much larger ones are often made. The smallest utensil is a rough model of a Fogarôiro, or chafing-dish, such as is to be seen in nearly every house in the country: over this the panelas, etc., are heated."

Ord. OLACINÆÆ. OLAX FAMILY.

Wood of Ximenia Americana, L. Tropical America and India. Used as a substitute for sandal-wood. The flowers are very fragrant, smelling like Cloves, a circumstance not noticed by Roxburgh. (J. S. Law, Esq.)

Ord. AURANTIACEÆ. ORANGE FAMILY.

All are familiar with the Orange-tree, type of this family, but few are aware that every part of the plant, the leaves, and even the petals more conspicuously, are filled with little transparent receptacles of volatile oil, best seen when held up between the eye and the light: hence the fragrance of these plants. The skin of the Orange, if strongly and suddenly pressed with the finger and thumb, sends out a little jet of essential oil, which takes fire on coming in contact with flame. The plants belonging to the Order are trees or shrubs, almost exclusively tropical and Indian; but the species and varieties of the Orange are now cultivated wherever a climate is found suited to them, and they are exported from the West as well as the East Indies. The wood is hard and compact; the pulp of the fruit more or less acid; the flowers often powerfully fragrant. The berries of *Glycosmis citrifolia* are said to be delicious, and those of *Triphasia trifoliata* very agreeable. *Bergera Königii* and *Feronia elephantum* are employed medicinally by the Hindoos; the latter yields a gum resembling Gum Arabic, and the leaves are powerfully fragrant. Oil of Neroli and Napha-water are delicious perfumes distilled from Orange-flowers; and *Cedrat*, a variety of the Lime, is another agreeable perfume.

Wampee Fruit. *Coolia punctata*, Retz. China and Molucca. Cultivated in the West Indies. (Mr. N. Wilson.) Dr. M'Fadyen says, "it deserves to be more generally cultivated on account of the fruit, which is produced in clusters the size, and have a good deal the taste, of the Grape, accompanied with a peculiar flavour, being very grateful to the palate."

Fruits of Feronia elephantum, Corr. East Indies. (Dr. Hooker). I am not aware whether these are brought to table as dessert. The young

leaves are said to be very fragrant, resembling Anise, and they are considered stomachic and carminative by native practitioners. The tree yields a gum much resembling Gum Arabic.

Bael Fruit, *Indian Bael*, *Bél*, or *Béla*, or *Bengal Quince*; sliced and dried unripe fruit. *Ægle Marmelos*, Corr. East Indies. (Dr. Hooker.) Delicious to the taste, but laxative; very fragrant. Unripe fruit considered by many a sovereign remedy against dysentery and diarrhoea, and it has of late become a very popular remedy in England.

Bark of the root of Ægle Marmelos, Corr. A decoction used on the Malabar coast, in cases of hypochondriasis, melancholia, and palpitation of the heart.

Citron; fruit of *Citrus medica*, Risso. Said to be a native of Media, and considered by some commentators to be alluded to in the 40th verse of the 23rd chapter of the Book of Leviticus: "And ye shall take you on the first day the *boughs* (*fruit*, Hebr.) of goodly trees," etc. This fruit is oblong, the rind very thick, wrinkled, divisible into two layers: that which is external formed of an infinite number of vesicles filled with an essential oil, the internal is thick, white, composing the principal part of the bulk of the fruit. It is used in confections: contains very little pulp, and the juice is less acid than the Lemon. The rind is the most valuable part, affording on expression a considerable proportion of essential oil.

Fingered Citron; a remarkable variety of the fruit of *Citrus medica*, reminding one of the "fingers and toes" in Turneps. China. (Hort. Soc.)

Lemons; fruit of *Citrus Limonium*, Risso. Native of Asia, probably China. Esteemed for its agreeable acid juice, adapted as a condiment both for animal and vegetable substances. Invaluable for preventing scurvy in long voyages, and employed, too, as a mordant for fixing vegetable reds. It freshens the colour imparted by *Carthamus tinctorius*, L. (Safflower). Specimens ripened in the open air in Devonshire are presented by J. Luscombe, Esq., Combe Royal. The most esteemed varieties in commerce, Mr. Archer tells us, are 1, the Wax Lemon (*C. Limonium cereaceum*, Risso); 2, the Imperial Lemon (*C. Limonium imperiale*, Risso); and 3, the Gaeta Lemon (*C. Limonium Gaetanum*, Risso).

Limes; fruit of *Citrus Limetta*, Risso, De Cand. Of this the acid is more abundant and purer than in the Lemon, the juice containing but a slight proportion of vegetable matter. Seven varieties are enumerated by Risso. The only kind brought into England, according to Mr.

Archer's 'Popular Economic Botany,' the *small-fruited sweet Lime*, is "about one-third the size of the common Lemon, and of a yellowish-green colour when ripe; but in order to preserve the delightful aroma of the rind, it is preserved green, which is the only state in which we see it in this country." This may be the case in Liverpool, and in England generally; but we know, from experience, that it is the raw fruit that is the most important ingredient in the preparation of "Glasgow Punch;" it thence derives its celebrity over punch made only with Lemons. An acid variety, as it appears, of this, Dr. Lindley (Medical and Economical Botany) considers the *Citrus acida* of Roxburgh.

Madagascar Lime, from Mauritius. (Mr. Duncan.)

Comquat; fruit of *Citrus olivæformis*. China. (Miss Wylde.)

Bitter or Seville Orange. *Citrus vulgaris*, *Risso*. This, the well-known Seville or Bitter Orange, is by some considered the native or wild stock of the true Orange (*C. Aurantium*), which is supposed to owe its sweetness and agreeable flavour to cultivation. It is distinguished by its rough coat, deep orange-colour, and its bitter properties. The latter recommend it for that excellent preserve called Marmalade, which is the crushed fruit, boiled in sugar. From the flowers, which also yield *Oil of Neroli*, *Orange-flower* water is chiefly obtained. It is this kind which is most easily and generally cultivated in our gardens.

Sweet Oranges; fruit of *Citrus Aurantium*, *Risso*. Varieties again of this well-known fruit are endless. *Risso* enumerates 169. "The most remarkable we receive," says Mr. Archer, "are the St. Michael's, the Blood-red, the Maltese, and the Majorca, or seedless variety." Of Sweet Oranges, as reported in Poole's Statistics, the imports were, in 1851, 300,500 packages, weighing 35,000 tons! Mr. Luscombe has ripened Sweet Oranges in the open air (as well as Limes and Citrons) at his seat in Devonshire, and presented samples to us. Besides the above, we possess Oranges, more or less distinct, from Brazil; *Bahia Oranges* (Captain Strutt), from Sierra Leone (Messrs. Payne and Sons), etc.

Orange Berries; immature fruits, used for making "issue peas."

Orange Flowers and Leaves; dried. South of Europe.

Models of Oranges, made of a soft wood in India. (Mrs. Maryatt, J. Law, Esq.)

Orange wood. *Citrus Aurantium*, *Risso*. Tuscany.

Tooth-picks made of Orange wood, made in Madeira (J. G. Johnson, Esq.), and at Rio Janeiro (Miss C. Croker).

Walking-cane of Orange wood. (J. G. Johnson, Esq.)

Oil, prepared from Orange seeds. Jamaica. (Dr. M'Padyen.)

Bergamot Orange, or *Mellerosa*. *Citrus Bergamia*, *Risso*. Fruit somewhat pyriform. Rind extremely fragrant, and, submitted to violent pressure in moulds, pretty small boxes are made of it. Both the flowers and fruit yield the well-known essential oil of Bergamot, extensively employed by perfumers.

Navel Orange, or *Larangeira seleta*. A variety with a depression, and a small protuberance at the top.

Shaddock. *Citrus Decumana*, *L*. The largest of all the Orange tribe: with very thick and spongy coat; called Pamplemousse by the French.

(*To be continued.*)

Biographical Account of M. ADRIEN DE JUSSIEU; by M. J. DECAISNE.

(Extracted from the Memoirs of the Imperial Agricultural Society of France, for the year 1854.)

In commencing a short notice of the *Life and Labours of M. Adrien de Jussieu*, a reflection occurs to my mind, which seems to bear peculiarly on the scientific career of our late illustrious colleague, while it explains and enhances our regrets.

In science, as in all the various paths which lie open to human activity, merit stands generally alone: it rarely descends from father to son; and it would seem that the nobility of talent, which we all cheerfully acknowledge, and which asserts itself by the benefits it confers, is still subject, like other aristocracies, to those alternations and reverses which remind us of the equality of human nature. If, by a rare exception, we do occasionally behold instances of genius perpetuating itself through many succeeding generations, and even waxing brighter and broader as it descends, still, like all things here below, it has its marked close and limit, which it cannot overpass; it vanishes, and the name which it had encircled with a halo of renown, remains but as a legacy which is bequeathed to family affection and pride.

The De Jussieus have been one of the privileged races in the intellectual kingdom. For a century and a half, from the days of Tournefort to the present time, they have figured in the history of Botany.

The names of Antoine, of Joseph, of Bernard, and of Antoine-Laurent de Jussieu are popularly known among us : these great men are among our national honours, and we may well be proud of the influence which their labours exerted in the whole kingdom of Natural History. To these illustrious names we must now add that of the last of the family, Adrien de Jussieu, the worthy representative of the fathers of the Natural System, whose recent death has cast a gloom over the whole scientific world. You have appointed me, as his more immediate pupil, to collect the principal incidents of a life which was so dear to us ; and I shall strive to justify your confidence, and thus also to repay some small portion of that debt of gratitude which I can never hope to discharge.

Adrien de Jussieu was born at the Museum, on the 23rd of December, 1797. His delicate health forbade his being entered at an early age at college, and he was educated at home by his parents. His mother, eager to contribute towards the opening of his remarkably intelligent mind, grappled with a study from which her sex usually shrinks, and taught herself Latin that she might instruct her son. In time however Adrien's constitution became more robust, and he was enabled to share in the advantages of a public education, the studies of the Napoleon Lyceum completing what had been commenced at home. At seventeen years of age, in 1814, the young De Jussieu obtained the highest prize in the annual competition, and gave a happy augury of his bright and successful future.

Free to follow his own predilections, Adrien de Jussieu would perhaps have devoted himself exclusively to literature. His profound acquaintance with the two languages of antiquity, his keen appreciation of the grand ideas and noble style of the learned writers of Greece and Rome, the peculiar turn of his mind, which, like that of Erasmus, had a touch of scepticism, leading him to delight in elegant discussion, his University success, all swayed him in favour of literature. But according to the good old axiom, "Noblesse oblige," he early felt that upon himself, the son, the grand-nephew of eminent botanists, the duty devolved of labouring in behalf of the inheritance which his forefathers had bequeathed him. Without relinquishing his favourite books, he gallantly devoted himself to Natural History, and his first essays in this new career foretold the lustre which he would confer on the illustrious name which he bore.

Amid the fields, and woods, and smiling country which surround Paris, and whither he was at a future period to conduct his own pupils, our young student of botany learned his first solitary lessons. But, according to custom, he also pursued the study of medicine, as his predecessors had done; and it being imperative then, to combine the title of doctor with that of botanist, the young De Jussieu went through the faculty course. At this period of life he became intimately acquainted with Achille Richard and Ad. Brongniart, and the identity of pursuits rendered their friendship all the closer.

The thesis with which our student completed, in 1824, his medical studies, was also his *début* in botany. He took for his subject the *Euphorbiaceæ*, discussing, at the same time, their medical properties and natural affinities as combined together, under the following title, "Plantæ quæ genere conveniunt etiam virtute conveniunt, quæ ordine naturali continentur etiam virtute propius accedunt." The thesis was couched in the Latin tongue, which was a rare piece of hardihood at that period; but its talent justified the innovation.

Each one of us, Gentlemen, when entering into life, brings with him an intellectual and moral and physical individuality; but our tendencies, and our readiness to adopt certain ideas, in preference to others, are affected by the circumstances in which we are placed, and our native faculties bear, more or less, the stamp of surrounding influences. Adrien de Jussieu could no more elude these impressions than other men can; and, fortunately for him, his friends were all of the most advantageous kind. L. C. Richard, Ampère, and Desfontaines were among his earliest associates, the inmates of his paternal home; soon after, Charles Sigismund Kunth, an admirable botanist, became his companion in work, and aided him in making many admirable analyses. When Antoine-Laurent de Jussieu began to succumb to the weight of years, M. Roepert led Adrien's mind towards morphological studies; and this German naturalist's Essay for a Monograph of *Euphorbiaceæ* called Adrien de Jussieu's attention to similar subjects; while this intercourse of two men, both pursuing the same career, produced no rivalry except that of the kindest friendship.

In 1826, after Antoine-Laurent de Jussieu had held, for fifty-six years, the post of Professor of Botany, he began to think of retiring; and the assembled professors of the Museum then nominated his son Adrien to the Professorship of Rural Botany, an honour which had

been granted, a century before, to his great-uncle Bernard. At this no very remote period, the study of indigenous plants was held to be an essential part of botany; and the herborizing rambles which were deemed requisite, held a considerable degree of importance in the minds of both professor and pupils. We had not then arrived at the opinion that there is little science and less utility in the distinction of species, and that the time devoted to this difficult labour is hardly better than so much loss; nor did we entertain the strange and contradictory notion, into which our *savans* are now apt to fall, that little advantage is derived from familiarizing ourselves with facts. We must not blink the question: such an error is destructive of all real science, and would be eminently injurious to agriculture, which rightly demands that we should pay attention to the slightest characters of the species and varieties which are subjects of cultivation. We must never forget that it is by botanical rambles that the habits of plants, and their organography, are learned, and that we thereby attain a clear idea of those specific differences, which lie at the foundation of all systems of classification. Many a zoologist and geologist, as well as botanist, would France and Europe have lost, but for those excursions, which are attractive at all periods of life, and by which those tastes and faculties have been elicited, of which their owners perhaps hardly were conscious!

Adrien de Jussieu's integrity of mind led him to appreciate, to the full, the importance of the office which was confided to him: he felt that it was his duty to teach beginners, and to decide perhaps, in a measure, those vocations which render man useful to his fellow-creatures. His was not a new task; his father, his great-uncle, and Sebastian Vaillant, had all been botanical demonstrators to the Museum, and he had tracked out the path which he was to pursue.

Those persons who joined in the excursions can attest how actively the subject of this Memoir devoted himself to the fatiguing duty. Without alluding to long and weary walks, and to the storms which, under our uncertain climate, frequently endanger the health of the pedestrians, it is no easy matter to be the constant referee in all those questions which a large party of students is continually addressing to the professor;—much patience, readiness of mind, promptitude of reply, and a cheerfulness which does not degenerate into familiarity, are indispensable; and above all, a perfect acquaintance with the varied forms of vegetation, and such a ready memory that the teacher may

not be baffled by any sudden and perplexing anomaly. All these qualities (not common, singly) did Adrien de Jussieu possess in admirable combination; and all his students, as well as myself, who so long shared his labours, can testify that he never relaxed his exertions, even under the attacks of the cruel disease which finally carried him off, and which his rural excursions never failed to aggravate.

M. de Jussieu was far however from being satisfied with thus advancing his favourite science. He felt himself called upon to promote it in a more direct and lasting manner. A series of memoirs, models in their way, and wherein the growing progress of botany has found nothing which required modification, proceeded from his pen, and fix his rank among the first European botanists. I have just alluded to his Monograph of the *Euphorbiaceæ*. Similarly confining his attention to generic divisions, he displayed the sagacity of his views in his Monograph of the *Rutaceæ*, and added to it those diagrams which display, with peculiar simplicity and faithfulness, the relative position of the floral organs. In 1830 he published a third Essay on the *Meliaceæ*: it is even completer than the two previous ones, for it includes all the specific characters of the plants in that family. It was followed by the Monograph of the *Malpighiaceæ*, M. de Jussieu's crowning performance, and on which he laboured for fourteen successive years, for it was not till 1843 that this noble Memoir was published, and it would have sufficed alone to establish its author's reputation. The deepest questions of anatomy and physiology are here raised and settled; they are the floral symmetry, anomalies, fecundation, and the remarkable structure of climbing plants in general. M. de Jussieu has adapted to the plates, illustrative of the generic character, a system of referential marks, which consists (as had been attempted by Mr. Robert Brown in his 'Illustrationes Plantarum Novæ Hollandiæ') in constantly designating the same organ by the same combination of letters or of signs. But what few botanists have noticed, and which seems to me peculiarly deserving attention, is the concluding plate, in which he has endeavoured to express the multiplied affinities of genera, and has thus shown that the Natural System is not, as had long been supposed, the *Linear System*. It were an overstepping of my present limits, if I proceeded to explain this novel view; and I will therefore only say that it contains the germ of the highest philosophical ideas. This Monograph of the *Malpighiaceæ* is a work, executed in the maturity of his abilities, and

which proves Jussieu to possess immense botanical knowledge, together with as penetrating and clear a judgment as had appertained to his illustrious forefathers, Antoine-Laurent and Bernard de Jussieu, themselves.

(To be continued.)

Report of a JOURNEY OF DISCOVERY into the Interior of WESTERN AUSTRALIA, between 8th September, 1848, and 3rd February, 1849; by J. S. ROE, Esq., Surveyor-General.

(Continued from vol. vi. p. 380.)

The sun being now very low, and the dreary "sand patch" yet to be traversed, we wended our way slowly onwards amongst its living hillocks, remarking on the sad spectacle we had just witnessed, having in all probability been occasioned chiefly by the want of water, which was anywhere to be had in abundance, within a stone's throw, by scratching a small hole in the sand. This presence of fresh water in the large sand-drifts of the sea-coast has often been observed by travellers, but never satisfactorily accounted for; nor can I assign for it any cause more rational or probable than its being the drainage of the back country through those caverns and hollow ways which, in limestone countries, so much abound.

Passing through much good grass, amongst Peppermint-trees and short steep sand-hills, we reached our camp before it was quite dark, and I observed the latitude of the clump of large Yeit-trees in which it was situated to be $34^{\circ} 24' 29''$ S.; three miniature woods of the same description extending in a line from it to the N.N.W., about a mile apart. Smiler was somewhat better, but still giving cause for uneasiness about him.

Next day we proceeded westward, along a beaten track of the natives, behind the sea-coast hills, where the land lay low, open, and for several miles nearly level, with small clumps of Yeit-trees, and rushy lagoons.

At the end of ten miles we descended the steep shore of the estuary which receives the Pallinup River, and crossing its dry sand-bar, which was only fifty or sixty yards across, encamped two miles up its southern shore, where we found abundance of excellent grass for our horses, and tolerable water, by digging near the shore of the estuary. The latter

was at this time very full, the water in it nearly salt, and grass scarce on its lower part. Poor Smiler having been left behind on the opposite side of the bar, standing in the estuary up to his saddle-girths, unable to move another yard, Messrs. Gregory and Ridley brought him into camp late in the evening, somewhat revived by his refreshing halt. It was nevertheless but too evident that, without further rest, he would be quite unable to accomplish the remainder of his journey, or even to reach Mr. Cheyne's establishment at Cape Riche, although not more than twenty miles distant. I therefore availed myself of this necessity for a halt, to examine the Pallinup River upwards, as it was crossed hereabouts by the line of direction taken by the shales from the vicinity of West Mount Barren. About our camp the granitic stratified rocks preserved the corresponding direction of $W. 18^{\circ}$ to 25° S., and had a dip to S. 25° E. of about 70° ; besides which, our hopes were further raised by observing an outcrop of red sandstone, with varieties of a lighter colour above it, and by a recollection that this was the river on which we had first noticed so many red and yellow cliffs about twelve miles higher up, on the 18th of November last.

The hills on the eastern side of the bar are entirely composed of such rocks, covered over with a loose sandy soil, but on the opposite sides they speedily rise to granite-hills of greater elevation, and terminate very abruptly to the eastward at Point Irby, or, as the sealers are in the habit of calling it, "Groper Bluff." This name has been applied by them in consequence of the locality being much resorted to by a large species of rock fish, weighing from thirty to one hundred pounds, which they have dignified with the name of Groper, in consequence of its feeding among the rocks, and detaching from them large limpets, sea-ears, etc., with its stout long teeth, resembling those of a pig. We caught one weighing about forty pounds, and found it of a dingy black colour, short, sturdy, and very strong, with large black scales, and a pointed head. It was well supplied with fins, and had soft protruding lips or gums, adapted to its peculiar mode of obtaining food. It proved excellent eating, very gelatinous and nourishing. Some wild ducks and duck-eggs were also added to our larder, the nests being found among the low bushes, from 100 to 300 yards back from the river's bank.

On the morning of the 7th of January every surrounding object beyond ten yards was completely obscured by the densest fog I have ever seen in Australia. Its appearance at that time was rather inopportune,

as our sick horse, Smiler, was nowhere to be found, and we began to fear he might have stumbled into the estuary from weakness, and been drowned. He was at length discovered lying down in a small thicket, and was brought into camp in a very weak and seedy state, notwithstanding his recent rest. Being nevertheless in hopes he would be able to accomplish the remainder of the journey to Cape Riche, now amounting only to fifteen miles, we commenced it so soon as the sun had acquired sufficient power to dispel the fog, and proceeded up a steep rocky valley to the S.W. Passing northward of the high granite ridge which extends westward from Point Irby, at the end of two miles and a half the horses were watered at a permanent spring of good water, called Noondeip, situate amongst granite rocks, in a watercourse descending to the south-westward. A mile beyond this brought us out upon the scrubby coast-hills, overlooking a snug little boat harbour at their feet, from which the extremity of Cape Riche bore S. 17° W. It was formed by a low rocky point on its south side, its sandy beach was open to easterly winds, and the sea broke heavily upon a detached covered reef, which lay to the southward of it, a mile from the shore. Passing up the steep rocky valley of a small watercourse which fell into this little cove from the westward, the travelling was very rugged and bad for nearly two miles, when the beach at length became practicable, and our horses felt much relieved by getting on to it. After scrambling over two or three rocky sandstone cliffs, which were lashed at their bases by a heavy surf, and crossing several small watercourses, with beds of the same description, we at length reached the mouth of Cheyne's Inlet, and were surprised to find it open, with a salt stream, ten yards wide and two feet deep, running strongly out. Our approach having been observed, we were met here by the worthy owner of the property, Mr. George Cheyne, who showed us how to avoid some quicksands in crossing, and then welcomed us to his hospitable abode with his accustomed kindness and cordiality.

After an absence of eighty-six days, which, to our weak and worn-out horses in particular, had been a period of almost unremitting toil and privation, they once again revelled in the enjoyment of good corn and rest, and, with the exception of Smiler, rapidly recruited their exhausted energies.

Here we remained four days, during which the horses were re-shod in their fore-feet; saddles, bags, and clothes were repaired and put in

order, and every preparation made for our return to the Swan, with provisions completed for twenty days. Every opportunity was taken of adding to my store of angles and other useful observations for my survey of the country; and for several hours on two successive days I watched from Cape Riche, and from the high land over it, for a covered reef of rocks which I was informed had been frequently seen by vessels three miles S.E. by S. from the Cape. Although my vigils were both during and after a fresh breeze, when this danger might be supposed to be visible, I could perceive no appearance of it with a good telescope, but have nevertheless no reason to doubt its existence. The latitude of Mr. Cheyne's large barn, by three stars on the meridian, was $34^{\circ} 36' 31''$ S.

As the water on the face of the country was now fast drying up, or becoming too salt for use, I hastened our preparations so as to have everything in readiness by the morning of the 7th of January; but it was then found that our native had become tired of the service on which he had been engaged, and had gone to rejoin his tribe. Finding it impossible to replace him without much loss of time, I had to abandon my intention of taking a new route to the westward and through the middle of the Stirling Range, as all parties agreed in assuring me that fresh water was then extremely scarce along that line, and could only be found by the aid of a native.

On January 7 we took leave of our hospitable friends Mr. and Mrs. Cheyne, to whom I felt greatly indebted for their kindness in facilitating all our arrangements; and leaving poor old Smiler to be recruited and forwarded on (as he was then so reduced as to be scarcely able to keep his legs), we proceeded along the beaten sandal-wood track on the eastern side of the Stirling Range, the remaining nine horses being much revived.

Encamping on the 9th at the spring of Poilyenup, near the Pallinup River, we were there joined by four teams engaged in carting sandal-wood to Cape Riche, for shipment to China, and next day we proceeded up the river, passing through much good grassy country in its valley and various tributaries. The branches of this river are numerous, and come chiefly from the eastward of north; but as I wished to make for the military post at Kojonup, we followed up what appeared to be the main stream coming from the N.W., and in twelve miles reached a place called Myerup, where Mr. Maxwell had a sandal-wood cutting-

station, at a good spring and amongst good grass. Here the beaten track terminated, and I could gain no information relative to water in the country in advance, but was fortunately enabled to engage a native to accompany us, and under his guidance followed up the river on the following day. The latitude of Myerup was found to be $34^{\circ} 8' 57''$ S., with Ellen's Peak bearing S. $21^{\circ} 15'$ E., and the Peak of Toolbrunup S.W. by S.

Our next bivouac was at some large pools called Kybelup, eleven miles further on, the intermediate space being grassy in the river's bed, but scrubby on extensive open downs immediately behind the valley. Shortly above this we quitted the Pallinup, coming from the N.W. in a rocky granite bed, containing pools of water nearly fresh. The grass in the river's valley had by this time depreciated much both in quantity and quality, and, as we proceeded westward, entirely disappeared in a level sandy country, covered with low scrub and brushwood. In seven miles and a half W. by S. from our last camp, we watered at Carramup, a spring of good water surrounded by a small patch of grass, at this time very dry, growing in tolerably good soil. White Gum and Yeit were also now frequently met with, and at the end of five miles of grassy forest land, extensively fired by the natives, we encamped at a fine open lake of good water, 200 yards in diameter, called Toolbrun. Ducks were very plentiful about it, and the country around teemed with Kangaroo and Emu. Here we met the families, or small tribe, to which our native guide belonged, and by whom we were welcomed to their ground. These, and all the aborigines we fell in with after leaving Cape Riche, were afflicted with the prevailing hooping-cough. They seemed however to adopt no precautions against it, and on the other hand, the disease had visited them but mildly; latitude $34^{\circ} 6' 55''$ S.

Next day we travelled through mostly forest country, in plains well grassed, and had abundance of good water, camping at the end of eleven miles upon the Gordon River, in large pools of good water. Here again we had to repeat remonstrances at the day's march being so short, but all in vain, our guide (who richly deserved the appellation of "Donkey," by which he had been distinguished by the white people) persisting in saying the water in advance was all salt and bad; latitude $34^{\circ} 2' 34''$ S., and native name Kylobunup.

Throughout the 18th of January we travelled over grassy forest country, intersected by many small tributaries to the Gordon, in some

of which were pools of good water, and in all of them good grass. Finding us resolved to proceed without them if they did not push on, our guides grumbled along at a somewhat better pace this day, and accomplished twenty-one and a half miles N.W. by N., halting at a small pool in a watercourse winding to the S.W., in latitude $33^{\circ} 48' 2''$ S. They called the place Gnow-yillup.

On the 19th, being personally unwell, and quite unable either to walk or sit a horse, I did not move away until 4 p.m., when we made a short stage of five miles, and soon after sunset reached a deserted sheep station of Mr. J. Hassell's at Carralup, on the left bank of the Beaufort River. The grass here was extensive and tolerably good, and the water of the river fresh, in large pools thirty yards across, winding to the N.W. A cart arrived soon afterwards to remove the contents of the hut, preparatory to Mr. Hassell transferring his principal station to the good country we had discovered on the 22nd of October, at Jeeramungup, on the Fitzgerald. This arrival from the haunts of civilized man put us in possession of various particulars relative to passing events in the colony, and made us acquainted, for the first time, with the result of Mr. A. Gregory's recent expedition towards Shark's Bay,—of his discovery of a lead vein on the Murchison River,—and of the Governor having been wounded by a native, on a visit subsequently made to the spot.

Proceeding south-westward along a beaten road next day, over undulating forest country covered with indifferent grass, at the end of seven miles we crossed another branch of the Beaufort in a soft dry bed seventy yards wide, filled with brushwood; and in four and a half miles more, reached another of Mr. Hassell's sheep stations, at a brackish spring called Warkelup, or Joseph's Well. Here the overseer was preparing to remove his flock also to the Fitzgerald, the country around having been extensively burnt by the natives, and the grass nearly all destroyed for the season. In four miles W.N.W. from this station we reached Kojonup Barracks, and were met with every desire on the part of the small military party stationed there to render us any little service in their power. By five stars on the meridian, the mean latitude of the Kojonup Barracks was found to be $33^{\circ} 49' 20''$ S., and two azimuths gave the magnetic variation $3^{\circ} 48'$ westerly.

Remaining at our camp on Sunday, the 21st of January, I performed Divine service to our little party, according to the custom invariably

followed throughout the journey whenever circumstances permitted, and next morning, having discharged our natives, we proceeded along the post-road towards Bunbury. The route lay amongst rocky forest hills, and both grass and water were in sufficient quantities for supplying our wants; but notwithstanding this, our horses continually cropped from many bushes on their way, and from none more eagerly than the poisonous plants which are so fatal to cattle and sheep. Our previous belief that horses could partake of these plants with impunity had now to be corrected, for after crossing the Blackwood at twenty-four miles from Kojonup, winding through hilly country, nearly all of them showed such alarming symptoms of weakness and lethargy that, on the morning of the 24th, I was glad to find a suitable place at which to halt them for the remainder of the day, three or four miles after we had commenced our day's journey. They were fortunately somewhat relieved by the short respite this afforded them, but it was not without some difficulty they were got on another stage of sixteen miles next day, to a branch of the Collie River, at this time in fresh pools, in latitude 33° 34' 25" S.

At twelve miles from the Blackwood River, the white gum and mahogany forests began to show some very good timber of the latter description, and it increased both in quantity and quality as we proceeded north-westward, improving as the white gum became replaced by red, and the trees grew closer, straighter, and better able to resist the pernicious effects of the periodical bush fires.

On the 26th we passed about twenty miles N.W. by W., to latitude 33° 27' 39" S., through forests of the finest timber that could be desired for naval and ordnance purposes; the splendid straight mahogany or jarrale trees growing within three or six feet of each other, reaching the height of fifty and eighty feet without a branch or blemish, and apparently quite sound. The red gum is equally perfect, although not so good for naval purposes as the jarrale, on account of its numerous gum-veins, which would appear to weaken the timber in the solid mass, and to render it unfit for any purpose requiring the exclusion of water. It is nevertheless highly prized by the Colonists for various purposes about a farm, and would apparently answer well for ships' beams, being of immense size, very hard, tough, and straight. It is however more subject to decay than the jarrale, which in its sound state, and free from sap, is not even assailable by those formidable and

universal destroyers, the white ant and sea-worm. The best timber is found in the most hilly country, and the greatest facilities are at command for the construction of roads through it; long, straight timber of any required dimensions being on the spot for bridges and viaducts.

Eight or nine miles on a devious course to the N.N.W., through hilly country equally practicable and equally well timbered, took us to the Ferguson; after crossing which, by a very good small bridge, the road became and continued for three and a half miles so steep and severe, amongst sharp abrupt hills, as to be totally impracticable for a loaded team. After this, the country opened out and became more level; the hills were left entirely behind, and a good easy road might be made throughout the intervening distance to the shipping port of Bunbury.

Having now reached a located part of the Colony, we passed by beaten tracks homewards, for the benefit of our weary horses, and on the evening of the 2nd of February arrived at Perth, after an absence of one hundred and forty-nine days.

During this period the Expedition traversed nearly 1800 miles of country; and although, from the nature of the interior, no great addition has been made to the amount of good land available to the Colony, much useful geographical knowledge has been acquired relative to a portion of this continent hitherto entirely unknown. Independent of all other considerations, and as being more immediately and practically beneficial to this Colony, the discovery which has been made on this occasion of coal in two available situations, at this particular juncture, is alone sufficient recompense for all the outlay and labour bestowed, especially if my anticipations are realized, that this valuable mineral may be traced even nearer than I found it to the anchorage in Doubtful Island Bay.

It is also to be hoped that, as one of the most valuable and most readily available sources of wealth in this Colony, the superb naval timber which I observed in such inexhaustible quantity in the forests behind Bunbury, will not much longer be suffered to remain there idle, but that, on the formation of practicable roads, the axe and saw will shortly resound amongst it, to the mutual advantage of the Colony and of its parent country.

The pleasing duty now only remains to me of reporting my entire satisfaction with the praiseworthy conduct of Messrs. Gregory and

Ridley, and of Privates Lee and Buck of the 96th, who were associated with me on this expedition. To the cheerfulness and alacrity with which each and all were ever at their respective posts, putting forth their best energies and exertions to overcome formidable obstacles and further the objects in view, is mainly to be attributed, under Providence, my successful accomplishment of the duties pointed out in His Excellency's instructions; nor can I speak too highly of that spirit of steady endurance and determination with which they met unavoidable privations, and faced difficulties and impediments of no ordinary description, during our long and toilsome journey.

BOTANICAL INFORMATION.

The Voyage of H.M.S. Herald; being an Extract of a Letter from Mr. MILNE, dated Island of Tanna, New Hebrides, December 4, 1854.

[The following may be considered a notice in continuation of the information given in our last volume (Vol. VI.), p. 353. We expect more full particulars from Mr. Macgillivray very shortly.—ED.]

I avail myself of the opportunity afforded by the Juno barque to send you a short account of our cruise since leaving Sydney. We touched first at Auckland, and then went to Waikihī (also in New Zealand), and I made a small collection of plants at the latter place; from thence to Sunday Island, south latitude $29^{\circ} 15' 30''$, and east longitude $2^{\circ} 5'$, which is an almost perpendicular mountain, and Mr. Macgillivray and I made an excursion to its summit. Nothing could be more interesting than the varied and rare kinds of *Ferns* which bordered our path, and hung gracefully suspended overhead, together with *Orchideæ* and *Mosses*. One *Tree-fern*, probably a *Cyathea*, struck me particularly. I noticed a *Palm*, which is said to be uncommon. The genera *Asplenium*, *Polypodium*, and *Doodia* abounded; and I saw a species of *Litobrochia*. On gaining the summit we observed a particularly fine *Lycopodium*, which grew on the bough of a tree, overhanging a deep ravine; and the desire to obtain it was so strong, that taking off my heavy botanical box, I climbed along the trunk of the tree, and when in the act of grasping the Fern, I lost my balance, and thought for a moment that

I was about to be precipitated into the abyss below. An instantaneous effort procured my safety; I seized the specimens, and descended with them in triumph. On the summit I also gathered many *Lichens* and *Hypna*. We kept the ridge of the mountain for a considerable distance, and were enchanted with the rich vegetation which everywhere springs out of the clefts of the volcanic rocks. Mr. Macgillivray collected many Mosses, and a species of *Jungermannia*; also four species of *Land-shells*, a *Vittarina*, a *Bulimus*, and two *Helices*. There are no reptiles nor beetles on Sunday Island, and but a few birds. We heard, at intervals, the pleasant notes of the *Parson-bird*, and we saw two kinds of *Mutton-bird*; one is large, and Mr. Macgillivray has given it a name, the other is *Puffinus assimilis*. The mountain-ridge produced *Veronica salicifolia*, and a pale blue-flowered *Lobelia*, both which are also found at New Zealand; likewise an *Orchideous plant*. We reached a projecting point, whence we obtained a splendid prospect of deep ravines, full of vegetation, craggy rocks grey with Lichens, and a beautiful freshwater lake. The sun had set long ere we regained the ship.

On Monday, the 24th of July, we quitted Sunday Island, and arrived at Minerva Reef on the 1st of August, and after surveying it, proceeded to Moala, one of the Fiji Islands. Here the natives were not at all hostile, so that we (Mr. Macgillivray and I) went on shore: they kept begging for pipes, but, to our surprise, made no request for tobacco, nor cared to take it,—a circumstance which was explained when we visited their villages, and saw bunches of the plant suspended against the native huts. These people raise a very good kind of tobacco, for smoking. One of the natives accompanied us in an excursion up a small brook, where grew large trees of *Erythrina Indica*, and a yellow-flowered *Eugenia*, many interesting *Grasses* and *Ferns*, especially *Lastrea* and *Pteris*, two kinds of *Marchantia*, and numerous shrubs, entwined with several species of *Convolvulus*. It somehow occurred to my mind that *Balanophoras* ought to grow in such a locality, and I spent more than an hour in turning over dead foliage, and hunting for them, and was just about to relinquish the search in despair, having no clue except the striking similarity of vegetation, etc., to that where I had previously found them elsewhere, when I spied a species, which I joyfully put into spirits, and I hope that you will pronounce it new. I have not time to say more about it now. Mr. Macgillivray has sent an account of our cruise to the 'Sydney Morning Herald,' and I have

requested a friend to forward the paper to Mr. Smith. Angan, another of the Fiji group, which we visited after Moala, has much the same vegetation, but possesses a larger number of *Cryptogamous* plants, some of which I expect are novelties. Without boasting, I may say that I have availed myself of every opportunity for collecting and for exploring the interior of the islands where we touched. Often and often I have passed nights on the ground, even while rain fell in torrents, which caused me a fortnight of sharp fever, before leaving the Fiji Islands.

At Angan and Ovulan, which we next visited, I gathered many *Orchideæ*, and have now between sixteen and eighteen plants of this tribe growing in a glazed case. The latter island is very mountainous, and its vegetation is peculiarly rich. By the margin of a large river in the heart of the island, I saw a solitary specimen of the Fiji *Dammara*, and learned, upon inquiry, that it had been brought hither from a neighbouring island by one of the natives, who planted it. The tree grew near a large native town, called Labbania, fourteen miles from Lavuka, where our ship was anchored; here I was alone, and obliged to trust myself entirely to the mercy of the people, whose reception of me at first was not particularly friendly. The principal chief was absent; but when he returned he treated me very kindly, ordered fish to be caught, a pair of fowls killed, and pork to be cooked for me, and forbade any annoyance being caused to me, on pain of death. I gave him several articles, with which he was much delighted, and finding that his protection was to be trusted, I remained two days among them collecting plants on the mountains. I afterwards returned to the same town with Mr. Macgillivray, and he and I examined their heathen temples. There are several Europeans on the island of Ovulan, who own small cutters, with which they trade in the Fijis. A Missionary also resides there, and the natives are well inclined towards Christianity. There is a large population among the mountains. Just now, dreadful wars are raging, caused by the cruelties of the King of Boro, or Baw, whom the people of Fiji are very anxious to deprive of all power, and to vest the authority in the hands of a ruler who shall be less sanguinary. This wretch has sacrificed thousands of lives, generally making brethren the instruments of his atrocities:—parents have slain and eaten their children, and children their parents, at his command; this is the cause of the war which is now desolating the whole Fijian Archipelago.

Our Captain next went to Ban and kindly allowed me to accompany

him, for I was particularly anxious to get plants of the *Dammara*; but to my great disappointment, I was told, on my arrival, by Mr. Waterhouse, the Missionary, that the forest of *Dammara* was twenty miles inland, and that the conflicts which prevailed among the natives rendered travelling most dangerous; on hearing which, the Captain forbade my attempting to go. By my absence from Ovulan on this occasion I also lost some of the plants I had gathered, being unable to attend to them for some days, for I was not allowed to carry them with me. I was glad to procure growing specimens of the tree from which the natives make their cloth, with portions of the bark in all stages of preparation, to the finished cloth, also several articles of native produce.

From Ovulan we sailed, on the 24th of November, to Aneiteum, one of the New Hebrides, and reached it on the 28th; but as the ship was to proceed quickly to Tanna, whence I now write, only forty-eight hours could be allowed at Aneiteum, which I strove to use to the best advantage; travelling fourteen miles across the mountains for growing plants, some of which I send you. Please to observe, particularly, one which appears to be a *Vaccinium*. I secured also that object of my chief desire, the *Dammara*, both alive, and seeds of it; with *Orchideæ* and many interesting *Ferns*; but had to sleep on the ground one night to obtain them.

We anchored at Tanna on the 2nd of December, at sunset. It was a Saturday, and at the entreaty of the native teacher, who had been sent hither from Aniëum, and who wished us to set a good example to the poor islanders, we stayed on board all Sunday. On Monday, Mr. Macgillivray and I landed; but we found the natives so troublesome, that we were obliged to be very careful, and for safety's sake, we could only move about in parties. We took our way towards the mountain, which is five miles from our anchorage, and were followed by a prodigious concourse of natives, who still realize the description given of them by Captain Cook, and since by Dr. Hinds, in their troublesome and inquisitive ways: they pulled open my botanizing boxes, they pilfered everything they could contrive to clutch. However, in spite of this annoyance, we climbed the mountain, upwards of 400 feet above the sea, and gazed into the volcanic pit, quite as much in depth and about two miles round, which is on the summit. In many places explosions were going on, red-hot stones being hurled up to a great height, with clouds of smoke and violent bursts of heat. A yellow margin of steaming, cho-

king sulphur surrounded the gulf. On the whole, this spot, which is most interesting to the geologist and very striking to every observer, possesses few attractions for the botanist, as no plants grow near the edge of the volcano. On our way there and back, we collected the more keenly, but found little that was peculiar to Tanna. An *Eugenia*, a *Banyan*, and a kind of *Fig* which produces a small fruit, the skin of which blisters the lips, though the natives are fond of it, with a *Barringtonia*, an *Hibiscus*, and a *Hoya* in bloom, were the principal flowering plants, together with most of the *Ferns* which I had already found on the Fiji Islands.

We are now bound for the Solomon Islands, in search of Mr. Boyd, having received accounts which lead us to hope that he may be alive there: I wish it might be true; at all events, I trust to make good collections in this new locality. We shall not return to Sydney before February, having laid in a store of provisions at Tanna. It will be a great satisfaction to me to hear that my last collections of living and dried plants reached you in good order.

NOTICES OF BOOKS.

WILSON, WILLIAM: *BRYOLOGIA BRITANNICA; containing the Mosses of GREAT BRITAIN and IRELAND, systematically arranged and described according to the Method of Bruch and Schimper, with illustrative plates.* 8vo. London. 1855.

The second edition of the '*Muscologia Britannica*' of Messrs. Hooker and Taylor has for many years been out of print. One of the authors has long been removed from the scene of his earthly labours, and the survivor, if his official duties in a great national establishment were not alone sufficient to prevent him from undertaking the task of a new edition, might well plead advancing years and its consequences, as his excuse for declining the responsibility of a third edition. Happily for him and happily for science, Mr. Wilson, so well known for the accuracy of his researches in this department of Botany, was ready and willing to take the duty upon himself. He was already considerably advanced in a '*Synopsis of British Mosses*;' and when a more enlarged

work on the same subject was proposed to him, with full descriptions and numerous plates, taking the 'Muscologia Britannica' and its figures as the groundwork, with entire permission to make what alterations he thought proper, the terms were accepted; he devoted his time and his talents to the work, and the 'Bryologia Britannica' now before us is the result.

The many additions that have been made of late years to the native Mosses of Great Britain; the great changes that the genera and species and arrangement, or classification, of the Mosses, have undergone, mainly due to the admirable 'Bryologia Europæa' of Messrs. Bruch and Schimper, required that corresponding improvements should be made in a work on British Bryology, as the science is now termed.

"While utterly disclaiming," says Mr. Wilson in his well-written introduction, "servile imitation, or indolent escape from the labour of sedulous examination of every point connected with the subject of this work, we have adopted the system of Bruch and Schimper, because it appears to be founded upon a legitimate and philosophic basis, and because any attempt to set up a rival system would be as presumptuous as it is superfluous. Entertaining harmonious views, and grateful for the kindly intercourse which we have so long enjoyed with our honoured friend Dr. W. P. Schimper, the principal and surviving author of the 'Bryologia Europæa,' we gladly acknowledge the excellence of that admirable work, wherein the principles of natural arrangement, imperfectly developed in the works of Hedwig and of Bridel, are so well and maturely carried out and applied."

This is then a new era in Bryology, and here the Mosses of Great Britain and Ireland are for the first time attempted to be arranged according to their natural affinities, and the author in a few words defines the difference between the artificial and natural classification. "The artificial classification had almost exclusive reference to the structure of the peristome, in conjunction with the form of the calyptra. The natural arrangement combines into one group all those species which have a stronger natural resemblance of structure, in all parts, than to those of any other group; the sum of characters, and not any single character exclusively, being taken into account." We can hardly fancy any one so insensible to the beauty and harmony of the latter arrangement as not to feel its superiority over the former. But as far as our own observations go,—and *Acotyledonous* plants have occupied no small

share of our attention in former years,—the Classes or Orders (for these terms are used in the same or in different senses) do not seem as yet to be capable of being divided into tangible groups or suborders with the same facility as in the case of corresponding groups in Phaenogamous plants: they appear so insensibly to pass one into another, that they can neither be defined by the pen or pencil, or even neatly distinguished by the eye. We have felt and expressed this repeatedly in our attempts to group the Ferns according to their natural affinities: and we feel sure that were Mr. Wilson and Dr. Schimper each to be engaged independently of the other, in working out a natural arrangement of the Mosses, they would come to very different conclusions in respect to the extent or limits of the suborders:—so insensible are the passages between any given group and its neighbouring, or indeed some distant, groups. The arrangement is nevertheless, we would rather say, on that account, a natural one; as far as a linear arrangement can be so. But here follows the difficulty:—they are incapable of definition: and so sensible does Mr. Wilson appear to be of this, that with that honesty of purpose which is so remarkably his character, he declines to offer any definition. With the exception of *Andreaeaceæ* and the *Sphagnaceæ* (which might as well be excluded from *Musci* as a natural group, as are the *Hepaticæ*), each consisting of a single genus, and as such characterized, *all* the rest of the Mosses are included in the third Order, *Bryaceæ*; but neither is that, nor any of the thirty-six suborders included under it, distinguished by a word of character or explanation. We think however, at p. 53, under the fourth suborder, *Seligeriæ*, we find an apology, and what is intended in some sort as a remedy, in the following statement:—“To avoid prolixity, we shall refer our readers to the descriptions of the *genera* for an idea of the respective *suborders* to which they are supposed to belong. *There is much to be learned before the exact limits of each group can be ascertained*; meanwhile it is our purpose to proceed on the plan laid down in the ‘*Bryologia Europæa*’ in all cases where good reasons to the contrary do not appear.”

If indeed there was no other arrangement in the volume but that just alluded to—the Natural—with the absence of characters for the subdivisions, a person not an adept in the science, who might take up and seek to determine a given genus,—*Fontinalis*, for example, which is placed near the close of the arrangement,—would have to wade through the descriptions of all the first eighty-eight genera of *Bryaceæ*,

before he would come to the one he was seeking. Fortunately for the tyro, there is, at the beginning, first, an "Analytic Key to the Genera," according to the dichotomial arrangement; and, secondly, a "Synopsis of the Genera." These however being purely artificial, we fear a student may be misled in some instances by them. We will take a case where, as in *Zygodon* (to be consistent with a *natural* arrangement), *Gymnostomum Lapponicum*, *G. Mongeolii*, and *G. viridissimum*, in spite (not of their teeth, but) of the *absence* of teeth, are properly referred to *Zygodon*. But in the "Analytic Key" and in the "Synopsis" we can only trace them to *Gymnostomum*, where assuredly they will not be found. Such we deem to be the defects of the work; defects perhaps due to too implicit an obedience to the 'Bryologia'* on the one hand, and in the case of the Analytic Key and the Synopsis, to too close an adherence to an artificial arrangement, founded on few characters, on the other. The remainder of our duty is of a far more agreeable character: and we hesitate not to say, that in no botanical work are there more perfect models of generic and specific characters and descriptions than in that before us; clear and distinct, full, but not tedious: every sentence and almost every word has its value. The synonyms are most carefully collected and selected, and the habitats are quite sufficient for the purpose. All is written in the English language, and that of the best description. A glossary of words "not in common use," of four closely printed pages, explains any new terms, and other botanical ones, which, without such aid, could only be intelligible to a professed Bryologist:—and the Index is perfect, both as to species and synonyms, and references to the plates and figures.

As was to be expected, the number of genera, as well as species, are much increased in relation to those hitherto published in works on British Mosses: the former more than doubled; in part, the greater portion, by the division of old genera, and in part by the additions of genera not previously known as British. Ninety genera are here enumerated, and 444 species, of which latter there were only 290 in the second edition of 'Muscologia Britannica.' Figures of all the new

* We think again this feeling is shown in the preservation of the genus *Anodus*, p. 55, "which scarcely differs from *Seligeria* in any other respect than in the absence of a peristome. Surely, to be consistent, either *Anodus* (*A. Donianus*, distinguished from *Seligeria pusilla* and its allies by the absence of a peristome and its smaller size) should be united to *Seligeria*, or the *Gymnostomoid* species of *Zygodon* should be kept distinct from *Zygodon*.

species are given. The English names of the genera are perhaps capable of improvement; and it may be worth the author's consideration whether, when a new edition is called for, as we trust will be the case ere long, it may not be right to make the *English* name of equal import with the *Latin* one. We find "Fork-moss," for example, to include the genera *Arctoa*, *Cynodontium*, *Dicranum*, *Leucobryum*, and *Fissidens*, which latter is placed widely apart from the preceding genera, in quite a different suborder. It is true, in olden time these all merged into one genus, *Dicranum*, or "Fork-moss." But there is as much need to change the English as the Latin names, if they are to be of any use. If this were done, the following singular misapplication would be avoided:—*Polytrichum* is very appropriately translated "Hair-moss," and the derivation given, "πολυς, *many*, and θριξ, *hair*; from the hairy calyptra." *P. undulatum* is now separated from *Polytrichum*, and one of its characteristics is to have the "calyptra naked and smooth," and hence its genus is named "*Atrichum*," from *a* and θριξ, *without hairs*: but the English genus is still "Hair-moss." Probably Mr. Wilson was led to adopt this plan out of respect to the nomenclature of Sir James Smith (and no author was ever more happy in this department of botany); but such would not have been the wishes of Sir James himself. At the time he considered (with Linnæus) *Fissidens* to be the same as *Hypnum* he gave it a corresponding English name; when it was, with more propriety, referred to *Dicranum*, he called it "Fork-moss;" and if he had afterwards ranked it in *Fissidens*, he would assuredly again have changed the English name.

GRAY, DR. ASA: *PLANTÆ NOVÆ THURBERIANÆ; the characters of some New Genera and Species of Plants in a Collection made by George Thurber, Esq., of the late Mexican Boundary Commission, chiefly in New Mexico and Sonora.* (Memoirs of the American Academy of Arts and Sciences, N. S. vol. v.) Cambridge, Massachusetts. 4to. 1854.

We have here, from the untiring pen of our able and excellent friend Dr. Asa Gray, besides descriptions of new species of known, several new, genera; for example, *Thurberia* among *Malvaceæ*; *Holacantha* (*Simarubaceæ*); *Olneya* (*Leguminosæ*); *Petalonga* (*Loasaceæ*); and *Eremastrum* and *Bartlettia* (*Compositæ*). A vast number of observations

are made on other and allied genera and species, which enhance considerably the value of this Memoir. Not the least interesting portion consists of extracts from the Journal of Mr. Thurber, prepared by that gentleman, at the request of Dr. Gray, "to give some idea of the geographical situation, features, and characteristic vegetation of the region in which these plants were collected;" to which Dr. Gray has appended valuable botanical remarks in the form of foot-notes. These together occupy eight large quarto pages,—too much to be transferred to our Journal, and not of a nature to allow of curtailment. The most striking plant met with was the *Cereus giganteus*, Engelm., a plant which the figure in 'Emory's Journey from the Missouri to California' shows to be very similar in general appearance to *C. senilis*, but which Dr. Engelmann has proved to be quite distinct. "The first specimen met with was in a cañon near the deserted Mission of Cocospera, and it brought the whole party to a halt. Standing alone upon a rocky projection, it rose in a single unbranched column to the height of some thirty feet, and formed a sight which seemed almost worth the journey (disastrous as it was) to behold. Advancing into the cañon, specimens became more numerous, until at length the whole vegetation was, in places, made up of this and other *Cactaceæ*. Description can convey no adequate idea of this singular vegetation, at once so grand and dreary. The *Opuntia arborescens* and *Cereus Thurberi*, which had before been regarded with wonder, now seemed insignificant in comparison with the giant *Cactus* which towered far above." The fruit is described in another place as an important article of food among the Indians, who collect it in large quantities and roll it into balls, which keep well without other preparation. The seeds from portions of this conserve, brought home, have germinated; and we may add that, thanks to our American friends, we have raised plants from a portion of these seeds sent in their pulp to the Royal Gardens of Kew.

Our Subscribers are requested, at p. 87 and line 21 of this volume, to correct with a pen the word "*parenchyma*," which should have been "*pleurenchyma*."



GHKT anal H. de Alvis del.

— Placodermis —

Vineyard, Toledo

*Notes on Sumatra; Extract of a Letter from JAMES MOTLEY, Esq.,
F.L.S., dated Sourabaya (Java), November 28, 1854.*

According to my promise, I sit down to write you some account of my trips to Sumatra at the beginning of this year, or at least to begin such an account, for when I shall be able to finish it I cannot yet tell. I am at present detained at this place by the vessel (by which I am on my way to Banjarmassing) stopping *en route* to take in some cargo; so that after seeing what was to be seen, I have a day or two on my hands.

My first attempt was an illustration of the proverb, "more haste, less speed;" for hoping the sooner to reach my destination, I selected far too small a boat, which proved unequal to the work. It was merely a common Singapore rowing sampan, with five men, and in this I started on the 16th of January at that pleasantest hour of the tropical day, when the light is just beginning to appear. After calling on board H.M. Surveying Sloop *Royalist*, homeward-bound after eleven years' cruise, and bidding good-bye to some of my oldest Indian friends there, I crossed the Straits of Singapore, passing close to the island of *Blukang Mati*, remarkable for the extreme virulence of the remittent fever which attacks all strangers sleeping there, as well as for its extensive culture of pine-apples. These are planted in rows all over the island up to the tops of the hills, some 200 feet high. They receive but little cultivation, this being apparently confined to destroying the taller weeds before the fruit ripens, and digging up the exhausted plantations to make room for new ones. The small suckers or buds surrounding the base of the fruit are preferred to the crowns or suckers of the root for planting. After the first fruit is cut, the stolons from the root are allowed also to fruit; and after this second crop is gathered, the plantation usually becomes so full of weeds that it is necessary to destroy it. The varieties grown are two,—one dark-coloured, with the segments of the fruit large, the other golden yellow. The first is the largest, but except in very dry weather is watery and stringy; the second is far better, though small. In flavour it rivals our cultivated pines, but its texture is much more coarse and woody. The fruit from these islands is exceedingly cheap; the labour of cutting and carrying to the beach is the principal part of their cost; so much so, that but a few years ago any person was allowed to take away a boat-load on condition of cutting an

equal quantity for the proprietor. They are still occasionally sold in the streets of Singapore at the rate of eight for one cent, or about a halfpenny, and many tons are daily consumed during the season, chiefly by the Chinese. The fibre of the leaves is also prepared at Singapore, but in limited quantities, being employed chiefly for fishing-lines and nets. It is cleaned by drawing the leaf between two blunt-edged pieces of iron, like the *Musa* fibre of Manilla. The pine-apples here are very subject to a deformity, by which the terminal bud or crown becomes enormously developed in a coxcomblike manner, "*Ananas jauygar*" of the natives. The crown is also frequently proliferous, and there is a very handsome variety called "*Ananas Kondeh*," of a pyramidal shape, in which all the buds at the base of the fruit, sometimes to the number of twenty or more, form each a small fruit with its own crown. In the fruit grown about the houses, the crown is frequently extirpated by scooping it out with the point of a knife when the flowers first open; the wound soon heals, and the bracts of the summit of the fruit close over it, so that without examination it would be easy to mistake the fruits so treated for those of a well-marked variety. The operation is supposed to improve the flavour of the fruit.

About 10 a.m. I began to enter the labyrinth of islands forming the south side of the Straits of Singapore. It is represented in most charts as two large islands, named "*Battam*" and "*Bulang*," but in reality consists of thousands of small islets, between which, and among the rocks and sand-banks scattered in every direction, the tidal currents run with great force and swiftness; fortunately however these were in our favour, and we were frequently carried along at the rate of five or six knots without sail or oar. My boatmen had forgotten to bring a sufficient supply of that indispensable necessary, the "*Sirik leaf*," and begged me to allow them to land at a small settlement to procure some. This place was called *Kasoo*; it consisted of about forty houses, built close to the beach, of ataps or palm-leaf thatch. A large piece of ground had been cleared in the rear of the village, but there were no attempts at cultivation beyond a little sirik and a few cocoa-nuts. All was overgrown by that pest of all eastern cultivation, the *Lalang* grass, *Imperata Koenigii*, and studded with gaunt, half-burnt trees, supporting huge bunches of epiphytal ferns, chiefly the *Sarang alang*, or hawk's-nest, *Asplenium Nidus*. The people seem to live chiefly by fishing and preparing fire-wood for the Singapore market. They use for this pur-

pose the wood of one plant only, the commonest species of *Rhizophora*, I believe *R. conjugata*; the Malay name is "Kayu Bakau." The wood is reddish-white, and splits readily; it burns well, and makes a very hot fire, giving out a peculiar smell, and is preferred to all other woods for cooking. The price at Singapore is one dollar for 1000 billets; these are about two feet long and one and a half to two inches diameter, or split to about that size. A considerable quantity of the bark of the "Bakau" is taken to China by the return junks, and it is also used by the native tanners in Singapore, mixed with gambier, but it makes an inferior, spongy leather, absorbing moisture rapidly, and, while new, staining of a dirty red colour everything it touches. This island appears to abound with a small species of *Moschus*, the "Pulandok" of the natives. They had a number of them, which had been caught in snares, confined in small cages ready to take to Singapore for sale, as well as a quantity of small long-tailed parrots of the genus *Palaeorius*, of which I saw large flocks flying about the dead trees, screaming loudly. Among other strange articles of trade here I saw a basket full of fat white *Annelidae*, as thick as the thumb and about a foot long. They are found in the decayed wood of a species of *Rhizophora*, called "Tameno," after it has lain long in the salt water, and fetch a good price among the rich Chinese at Singapore, who consider them a rare delicacy. Besides the Sirik leaves which my crew procured here, they got also the unripe fruit-spikes of another *Piper*, which they call "buah chabai," or pepper-fruit. It is sold strung upon threads, and can be dried without losing its flavour or pungency, and on that account is valued by the Malays for taking to sea in their boats; for the leaves, though very tenacious of life when carefully packed in the sheathing leaf-stalks of the plantain, cannot be preserved fresh more than eight or ten days.

Nothing can exceed the beauty of the singular scenery of these curious archipelagos. I counted, several times in the course of the day, more than a hundred islands in sight at once, while at other times we were carried by the current through narrow channels where the trees almost met over the boat. The rocks belong to the same peculiar formation as the greater part of the island of Singapore,—clays, argillaceous sandstones, and conglomerates, chiefly of quartz pebbles, and sometimes exceedingly coarse, all intersected by reticulated siliceous veins, more or less hard. The clays and sandstones are nearly all ferruginous, some very highly so, and often of beautiful red and purple tints; and the

whole formation is intersected in every direction by large veins, dykes, and masses of laterite, sometimes cellular, powdery, and ochraceous, but more frequently very hard, dense, and heavy, of a blackish-red colour, and containing 75 to 80 per cent. of iron, but probably also too much silex to be very valuable as an ore. These strata are very much disturbed, being inclined at high angles and in various directions, and often much curved and contorted; consequently, though few of the islets rise more than one hundred feet above the water, their shores, when rocky, are very picturesque. Many however consist only of sand and broken coral, and not a few almost entirely of loose, waterworn blocks of very hard, heavy laterite, apparently left behind by the degradation of the strata in which it was enclosed. Many apparently small green islands are merely clumps of salt-water trees, such as the "Bakau," "Tameno," and "Tunga," all species of *Rhizophora*, the "Pempat," a *Sonneratia*, and the "Apiapi," an *Ægiceras*, growing upon a reef of mud and broken coral, exposed only at low water. Numerous beds of coral are everywhere seen through the clear water glowing with all the colours of the rainbow, and supplying at once food and shelter to the brilliant fish always seen among them. Most of these coral fish are furnished with numerous and strong teeth, and they literally graze upon the summits of the coral. They may be seen, as it were, rasping off the surface, and their stomachs always contain a large quantity of a pasty, calcareous substance, which is, I believe, the indigestible part of their food, to the peculiar nature of which they probably owe their sometimes poisonous properties. As might have been expected, I found many shells wherever I landed, and the air was enlivened by numbers of hawks, pigeons, terns, sandpipers, kingfishers, herons, and ibis, which find among these solitary islands the two great desiderata of plenty of food and an undisturbed retreat.

The vegetation of these islands is not very peculiar, being usually that of the coasts generally in these latitudes. *Rhizophora*, *Sonneratia*, *Ægiceras*, and two species of a Combretaceous genus, one with scarlet and one with white flowers, and the "Neari," whose large fruit I sent you from Labuan, prevail in muddy places, growing almost or quite in the water; they are sometimes accompanied by *Nipa* (*Nipa fruticans*), "Pecai" (*Acrostichum inaequale*), "Rotan laut," or Sea rattan, so called because its long stems answer imperfectly the same purpose; I think it is a *Pluggellaria*; *Dilivaria ilicifolia*, and a species of *Pandanus*, the "Kasott

samak" of the natives; the last five plants are however always a sign of some admixture of fresh water, and have led to the discovery, in many instances, of small springs, rising in little clay basins carefully concealed among the bushes, but known to the natives of the archipelago, who, in their fishing excursions, get a scanty supply of brackish water from them. In these places there is no regular beach, the waves break up at high water under the arched roots of the Mangroves and among the asparagoid suckers, rising in long lines through the mud from the far extending roots of the Perupat, whose dingy grey foliage, crooked branches, and sturdy trunks contrast well with the bright green leaves, gaudy stipules, and lithesome habit of their neighbours, swinging and glancing in the sun at the stroke of every advancing wave, upon whose surface float thickly the fallen flowers and strange long-pointed embryos of the one, and the purple filamentous stamens and ligulate petals of the other. When the tide is out, the ends of the leaves of the curious genus *Enhalus* may be seen floating in the shallow water; and at spring-tides, when only, I believe, the plant blossoms, the white anthers, detaching themselves from the submerged and nearly sessile male flowers, are seen drifting over the water like fairy navies in search of the fixed female flowers, whose long stalks bear them to the surface. The fruit of this plant, which is round, hairy, and generally much encrusted with mud, is eaten by the natives under the name of "Buak laut," or sea fruit; the seeds are slightly farinaceous, and taste like chestnuts soaked in salt water: of the curious economy of this plant I think I gave you an account before. I saw not unfrequently in such situations, growing among stones half-imbedded in mud, a plant with ovate, translucent leaves and stipules, like those of a *Potamogeton*, the leaves on long petioles from the joints of the creeping radican stem, but I have sought in vain for the flowers or fruit; several minute *Zosteraceæ* are also common, but generally where the mud is more sandy.

The sandy beaches yield a greater variety of plants: the common sea *Pandanus* forms sometimes almost impenetrable thickets, and occasionally the sweet-scented variety or species, "Pandan Wanyi" of the natives, is seen; but I believe it has been accidentally planted, as it usually affects fresh water. Among the most usual plants on the sand are *Cassia cæsia*, *Vitex Negundo*, *Cycas circinalis*; "Puku laut," or Sea Fern; *Paritium tiliaceum*, "Barou" or "Warou;" *Casuarina litto-*

ralis, "Aroo;" *Convolvulus Pes-caprae*, "Tapak kurbau," or buffalo's foot-mark; an *Euphorbia*, very much like *E. Paralias*, "Tuba laut," sea tuba (Tuba being the root of a Papilionaceous climber, I think a *Dalbergia*, used to intoxicate fish); a *Cyrtum*, I think *C. Asiaticum*, "Bakong;" a *Carex*, with the habit of *C. arenaria*; *Gandarussa vulgaris*, *Ganda rusa*, a common febrifuge medicine with the Malays, and I believe a good one; a cordate-leaved *Cissus*, generally climbing on the *Casuarina*; *Dillenia speciosa*, a plant of numberless varieties, "Simpoor" of the natives; a scrambling *Wollastonia*; and a *Phyllanthus*, with handsome white and red fruit. Two species of *Paspalum* and a *Rotbœlia* are common, and occasionally *Spinifex squarrosus* is seen, with its long racemes and glaucous foliage, climbing high up among the bushes. A small, rich orange-coloured *Cyperus* is common, with the culm so short, that the numerous long-stalked capituli seem at first to rise at once out of the sand. All this vegetation is often matted together by a species of *Cassytha*, I think *C. littoralis*; the *Vitex* in particular is often entirely destroyed by it.

The rocks,—generally covered with a thick mat of large Ferns, *Hoyas*, and some Orchids, of which the commonest are *Dendrobium crumenatum*, *Cymbidium aloifolium*, a little white *Trichopetalon*, and a *Thelasis*, with curious little compressed pseudobulbs, looking like strings of beads,—are crowned by large bushes of an orange *Leora*; several species of *Ficus*, yielding food to immense flocks of the beautiful white sea-pigeon, and frequently monkeys; a species of *Podocarpus*, like *P. latifolius*; *Calophyllum*, I think *C. spectabile*, "Panagya;" *Terminalia Catappa*, "Katapang;" occasionally a species of *Yucca*; and the magnificent *Pandanus latissimus*, "Gadore," I think almost the queen of tropical plants; the stems are sometimes thirty feet high, and the enormous fruit, when ripe, as white as ivory. *Fagraea auriculata*; *Barringtonia speciosa*; *Myrtus tomentosa*, "Karamanting;" and *Melastoma Malabathrica*, are also sometimes to be seen in such situations. On these plants, especially on the *Terminalia*, are found several species of *Loranthus*, and a small leafless *Viscum*, which is parasitical only upon the *Loranthi*; and I saw several species of *Dendrobium*, three of *Atrides*, a small *Bolbophyllum*, a *Cryptostoma*, and four species of *Appendicula*, with several epiphytal *Hoyas* and *Melastomaceæ*. One species of *Dischidia* is very remarkable, from its bunches of orange-yellow ascidia, which however hold no water; their purpose in the economy of the

plant seems to be to protect its aerial roots from the sun, as these are always found within the metamorphosed leaves, ramified on and slightly adhering to their inside surface; they are, I think, invariably full of ants, and of one peculiar species.

The upper part of the island is generally covered with the usual jungle trees, *Guttiferæ* and *Myrtaceæ* (among the latter a *Syzygium*, with black eatable fruit) perhaps prevailing. A small *Myristica* is very abundant on some islets, as is also a Sapotaceous plant with rufous leaves, yielding a concrete white gum, used some time ago to adulterate gutta-percha, but now no longer saleable. The plant yielding the finest India-rubber, I think an *Urceolaria*, is common here; it is a large climber as thick as a man's leg, with a dark rugged bark: it is called "Jintawan" by the Malays, but this includes three species, the "Menungau," the "Sarapit," and the "Patabo;" the fruit of the "Sarapit" is the best, but all are much valued by the Malays, the pulp surrounding the seeds being very sweet, with a pleasant acid, and a fine vinous flavour. To collect the sap the stem is usually cut into billets a few feet long, from both ends of which the milky juice flows abundantly; and the plant soon springs up again. The gum is not collected among these islands, though the locality, always within reach of the sea, is highly favourable, the only preparation required being to mix salt water with the sap, the solid parts of which instantly coagulate. A gigantic climbing Grass, probably a *Nastus*, festoons the trees with its snaky, leafless stems in every direction, and a large creeping *Bauhinia*, with changeable yellow and red flowers, is often seen; and the high, dry parts of the islets are often nearly impassible from the thorny leafstalks of a *Licuala*, a beautiful little palm, its long spikes of scarlet berries bending down almost to the ground; it is called "Pallas," in common with one or two others of the same genus. The tallest, and perhaps one of the commonest trees on the higher ground, is, I think, a Diterocarpous plant; its leaves are silvery beneath, like an *Elaeagnus*, which makes it very ornamental; its light red wood is straight-grained and easily worked, and is much used at Singapore, under the name of Seraya, for house carpentry: I could not find its flowers or fruit.

These islands are not the places in which we can expect to find many aerial *Cryptogams*. I did not see in all more than half-a-dozen species of Mosses: a *Calymperes* in fruit on the Mangrove trunks, a small *Hypnum* on decayed wood, and the others barren and very

sparingly on the ground. Some *Hepaticæ* I observed in fructification, chiefly on the upper parts of the arching Mangrove roots. The Lichens too were not conspicuous, except one very beautiful *Opegrapha*, on the smooth bark of the *Cycas*; the leaves of a small *Syzygium* were in several places covered by an elegant but very minute Lichen. *Algae* are not so abundant as might naturally be expected, excepting the common species of *Sargassum*, several of which are here almost universal; the most remarkable is the eatable "Agar-agar," of which more hereafter; a profusion of a beautiful plant, I think the same called formerly *Ulva Pavonia*, but whose modern name I do not know; and a small plant, allied to *Lichina*, which covers the stones at high-water mark with its minute creeping roots and fern-like fronds, looking much more like a *Hepatica* than what it really is.

Although I have spoken only of my first day among these islands, it must be understood that I have condensed all my notes on the vegetation made in passing through them in all six times, and always in different ways. In the course of these several trips I landed on upwards of thirty islands, so that I believe I have given a very fair summary of their general features; there are however a few islands of considerable size, and containing much higher hills, and of these the vegetation would doubtless be different, and more varied, but I believe the geological formation to be all the same.

The whole of this archipelago is a Dutch possession, and forms part of the Residency of Rhio; but the few petty chiefs I saw seemed virtually independent, and are probably rarely interfered with; indeed any active government of them would be impossible, except by a force of gunboats or steamers, whose cost would be quite out of proportion to their value and importance. I believe one or two of the chiefs receive small pensions. Dutch money is nominally in use, though I found the people very willing to receive Singapore currency for their goods. The settlements are very much scattered, and the inhabitants are in no very good repute, being said to be by no means cured of their piratical propensities. Small boats from Singapore are occasionally cut off, and the bands of Malay robbers who occasionally land and plunder small detached settlements on that island, are believed to come from the islands. One or two of the leaders of these bands are known by name; the most notorious of them is named Hamet: he has carried on the system for years, and is much dreaded by the natives at Singapore.

He is a native of Boo-oo, one of the westernmost of the group, where his wife and children live, and where he might surely be taken without much difficulty by a little activity.

The ostensible occupations of the people are fishing, collecting shells and coral for sale at Singapore, gathering and drying "agar-agar" and "trepang," collecting Mangrove bark, cutting firewood, cutting and rafting to Singapore, sampang, seraya, and other light woods, for sawing into plank, mast-pieces of "Puhn," or "Bintangar," *Calophyllum inophyllum*; and crooks for shipbuilding of "Perupat," "Pumayga," "Katappang," and a species of *Ficus*: on some of the larger islands a good deal of fruit is produced, and mats of the long leaves of the "Bankwang," a species of *Pandanus*, and dammar torches are made at some of the settlements.

The evening looking very threatening, and the boat being too small to allow us all to sleep dry under the palm-leaf awning, the boatmen steered about six o'clock for a settlement called Ikea, on an island to the south-west of the group. It was nearly dark when we reached it, and quite low water: a broad bank of stones and coral extended about two hundred yards from the beach. One of the men landed to reconnoitre; while he was picking his way over the rocks, a party of wild pigs came down to feed on the tideway, but they kept out of the reach of my rifle. Our ambassador soon returned with two enormous Nangka fruits (*Artocarpus integrifolia*), which he had taken from a tree near the beach, and had much difficulty in carrying, and bringing the unwelcome intelligence that the settlement was deserted and the house unroofed; so we were obliged to push off again. By the time we got clear of the rocks it was quite dark; but after a little consultation, the men directed their canoe with apparent confidence to another settlement, named Sungei Sipagu, on the island of Suygi. In passing through a narrow channel between two islands, the tide ran so strong against us that we were obliged to anchor, and we did not reach the place until about midnight. It is situated on a "Permatang," or sort of narrow sandy peninsula, separated from the main island by a narrow salt-water creek, fringed with mangroves, up which we pulled some distance to reach it, the trees almost meeting over our heads and glittering with innumerable fire-flies. Our arrival caused some disturbance, and at first some little alarm; for none of our voices being known, the people took us for pirates, and the men who came out of the houses were all well armed

with guns and spears : we soon explained ourselves however, and I was then comfortably settled in the head man's house, sleeping on a rattan mat with my rifle and hunting knife by my side, a precaution I thought prudent, in spite of the assurances of my boatmen, that though the Suygi people were occasionally pirates, they never injured any one coming among them in a peaceable manner.

I was up at daylight in the morning looking about me. The settlement is a new one ; a few trees had been cut down, but there was yet no cultivation beyond a few cocoa-nuts planted among the stumps. The people were busy spreading agar-agar on mats in the sun to dry, and pounding dammar, or *Dipterocarpus* resin, of which they said the woods here yielded abundance, in wooden mortars, to make torches ; when pounded very fine, it is melted in boiling wood-oil, the fluid resin of *Dipterocarpus trinervis*, and several other species, and mixed with crumbled rotten wood, until it is of a consistence to be formed into batons eighteen inches or two feet long and about two inches in diameter ; these are covered with the leaflets of a stemless palm, *Zalacca conferta*, which grows abundantly in freshwater marshes ; its fruit is large and deep brown, and hangs sometimes quite down in the mud, in densely clustered branches, almost hidden by the half-decayed bracts ; the pulp surrounding the seed is intensely acid, and is much used by the Malays as a condiment ; the Malay name of the plant is " Palumbai," or sometimes " Assam paya," " bog acid." The torches now look like gigantic cigars, and are sold at from two to five cents each, according to their size : many are used at Singapore by the gambier makers, who at a particular point of the evaporation of the extract require a sudden and fierce fire, which they get by throwing under the pans two or three of these torches. They are commonly used in the Malay houses for light, fixed in a sort of clumsy wooden candlestick ; they give a bright, good light, but are very smoky, and require almost constant trimming, but are well suited to the open houses of the natives, because they are not easily extinguished by the wind.

After a good bath at a clear spring, which was full of a pretty little blue-flowered *Utricularia* with short ligulate leaves, which formed a thick turf all round the margin, we started again about half past six o'clock. The tide was very low as we emerged from the creek, and on an extensive flat reef of stones and broken coral was a large party of women and children collecting " agar-agar" and " tripang," and carry-

ing it to their canoes afloat at the edge of the bank; this employment was occasionally varied by a chase after some unlucky fish or crab, which had strayed into the shallow water. The "agar-agar," when good, is of a cartilaginous texture, colourless, and nearly transparent; it grows chiefly upon the dead and broken coral, and is usually from two to six inches long; it has a tolerably dense shrubby habit, the branches terete, about two lines in diameter, solid, and thickly covered with blunt tubercles. I do not know its genus,* and have not seen its fructification; but I know nothing about *Algæ*. When gathered it is carefully picked and cleaned, and dried upon mats in the sun; this occupies in fine weather about ten days; it is then packed in bags or baskets, and in this state sells for about ten dollars per picul of $133\frac{1}{2}$ lbs. It is now as dirty and disagreeable-looking an article as need be, being shrivelled, and of a dingy yellow, with a strong and nauseous marine smell. For use it is steeped for several days in fresh water, frequently changed, and swells again to nearly its original size; by long boiling it dissolves almost entirely into a strong jelly, peculiarly short and brittle in its texture when cold: this jelly forms the basis of many dishes, both sweet and savoury, and is in great use in China, to which country large quantities of the dried weed are exported from Singapore; it is also generally liked by Europeans, and might perhaps be introduced with advantage into the home trade.

We now wanted to get to the southward, but the wind was dead against us, and after getting clear of the islands, and into comparatively open sea, I found that our little boat was not able to face the swell, now rising rapidly. After several attempts to face it, and shipping two or three heavy seas, I determined to return to Singapore and procure a larger boat. I was the rather induced to do this, as I heard at Suygi, that the Sumatra rivers were now all in flood, and we should be many days in getting up to the interior; not a very pleasant prospect when we were unable to sleep dry in the boat. About ten o'clock, therefore, we ceased rowing, much to the satisfaction of the crew, and hoisting our mat sail to the fair wind, reached Singapore in the evening.

Banjarmassing, Dec. 19, 1854.

I wrote thus far at Sourabaya, and on our passage to this place, which has been a long and tedious one. I cannot tell you much about Ban-

* *Plocaria candida*, Nees, or some allied species; and not very far removed in nature and habit from the Caragene of Ireland, *Chondrus crispus*.

jarmassing yet, as I came up the river in the dark, and our only walk is a path of about a mile along the bank among the houses; the whole country is a vast marsh, utterly impassable, and I hear we must go up the river for twelve hours further before we get any solid ground. I saw however from the sea some hills, among which my colliery will be, and within a short distance there are some apparently primitive ones, perhaps 2000 feet high; at present I am very busy preparing to explore the country, which must be done before we can begin. I shall write you again soon; and in the meantime I add a sketch of a fence before the house where I am writing: the cross-bars of palm wood have been inserted into the living wood, which has grown out over them; the trees have now no flowers, but I think they are a species of *Spondias*; the fence is many yards long, and every tree is alike.—J. M.

Biographical Account of M. ADRIEN DE JUSSIEU; by M. J. DECAISNE.

(Extracted from the Memoirs of the Imperial Agricultural Society of France, for the year 1854.)

(Continued from p. 143.)

I shall not undertake to specify all the valuable Memoirs which M. de Jussieu has composed: an enumeration of title-pages gives no idea of a writer's ability; and it is eminently in works of analysis and descriptive botany, in the definition of groups, and the application of their characters, where the greater portion is effected by the arbitrary will of the *savant*, that we are apt to make mistakes as to the talent of an author. The public sees but the outside of a book; its contents are a sealed letter; and one therefore has no standard of its value beyond the bulk and number of the volumes which the writer has produced. But open the clasp, and thread the labyrinth of details which make up the characteristic marks of the genera and species, and you will presently feel, as you proceed, whether the book is, or is not, composed by a man who possesses that natural gift of observation, combined with powers of combination, which is indispensable for the definition of individual species and the establishment of their analogies. Now, it is by these traits that M. Adrien de Jussieu was eminently characterized. During many years, he subjected his analytical labours, with ever-increasing severity, to the laws of unity. The study of the relations of families

among themselves had become his chief occupation ; it was, so to speak, the inheritance he had derived from his forefathers, and upon which he concentrated all the faculties of his mind.

I cannot pass over in silence an article on 'Botanical Taxonomy,' published, in 1848, in the 'Dictionnaire des Sciences Naturelles,' and which it is hard to believe yet continues but little known, or well-nigh forgotten. This fragment, of barely seventy pages, is, in my opinion, one of the very best essays on Philosophical Botany that has appeared since the days of Linnæus ; the author takes a review in it of all the different systems which have been started from the time of Ray and Rivinus. It is a true History of Botany, and a critical history too, which discusses and decides upon the systems with that superior talent and exquisite discrimination which eminently characterized Adrien de Jussieu. His early partiality for literature is seen throughout, and the taste of the youth adorns the mature judgment of the ripened *savant*. No man was more completely versed in botanical literature ; his library, which had been commenced by his forefathers, contained all botanical books, even the most ancient ; and their possessor was erudite, in the strictest sense of the word. It was his fixed intention to crown his long labours in the cause by a complete history of his favourite science. For many years had he been occupied in collecting the materials for a work which is still a desideratum, and which he alone, of all men in France, was capable of performing—when death stepped prematurely between, and put a close to his labours.

He has however left a book which has made his name popular among the young : it is his 'Elementary Treatise on Botany,' a work simply and elegantly written, clear and methodical, in which most of the important questions concerning the science are handled with a sufficiency of detail for the learned, yet with a simplicity which makes them intelligible to beginners. The value of the book is shown by its having already reached a seventh edition ; nearly 30,000 copies having been sold in ten years ; and it is moreover translated into the principal languages of Europe.

And now, Gentlemen, I have set Adrien de Jussieu before you as a learned writer, and I have yet to speak of him as a Professor and a member of the Academy of Science, and to recall to your minds the period, unfortunately but short, in which he shared your labours. It was in 1845 that he was appointed to succeed M. Auguste de St. Hilaire

as Professor of Vegetable Organography to the Scientific Faculty; he was then in the full prime of his talents. His high reputation, the popularity of his botanical excursions, the simplicity and clearness of his diction, attracted an attentive audience, where the statesman and the literary character might be seen mingling, as they often did in the herborizing rambles, with the young students. When first accepting the chair, M. de Jussieu had expressed his intention of avoiding all needless brilliancy of language, and of so uniting simplicity, precision, brevity, and method, as to be intelligible to all his very miscellaneous auditory. I cannot better characterize his teaching than by saying that it was founded on the principles laid down in his 'Vegetable Taxonomy.' The object which he kept constantly before him, and to which he directed all his views, was to point out the great influence exerted by the natural method on the sciences of observation: he sought to exemplify, in their fullest sense, those remarkable words of Cuvier, "The natural system is science reduced to its simplest expression."

It was seldom that he became animated: calmness was the feature of his manners, as timidity was of his disposition; and he preferred, among his hearers, those individuals who displayed a character like his own,—placid, earnest, and deferential. To see that amiable *laissez-aller*, that easy and witty conversation, which enlivened his botanical excursions, you must have followed him into the open air, where, comparatively free and independent, he could throw off the trammels of the professor. Released from the heavy responsibility of public instruction, he began a kind of private teaching, cheerfully answering the many questions which were put to him, and often recapitulating, in the freest manner, all the lessons of his professorial chair. He enlivened his conversation with anecdotes, and became so infinitely attractive, that his students often urged him to allow them to accompany him, not only through the Court of the Sorbonne, but to his own dwelling. The custom,—now, alas! but traditional,—which the older professors had pursued, of making friends of their pupils, was kept up by M. de Jussieu: he took part in their exertions, he encouraged and applauded them, and with all the sincerity of his own mind, he rejoiced in their success, and felt delight in guiding their inexperience by his truly paternal counsels.

When he became a member of the Academy of Sciences, in 1831, it was often M. de Jussieu's part to give an opinion on the Essays sub-

mitted to the judgment of this learned body, and he invariably executed the task with a kindness which had the effect of encouraging the young botanists. His various reports, among which I would specially point out the one which refers to the great prize of Physical Science, and which has, for its subject, the motions of the reproductive bodies or spores of the *Algae*, etc., are models of analysis and of elegant illustration.

Thrice nominated Director of the Museum, he displayed a perfect knowledge of men and things, and such an amount of sagacity, and such a just appreciation of the interests of that great establishment, within whose precincts he was born, that his memory is combined with an infinity of administrative measures, which have proved of extreme value to the Institution. Firm, yet gentle, he never faltered in the execution of any duty. During our national disturbances he rose to the height which the emergency required, and so conducted himself, that his presence of mind had the effect of rendering the Museum a species of neutral territory, thus averting the danger which impended over our treasury of scientific wealth.

At the death of M. Desfontaines he was constituted Director of the Herbarium, an office which he afterwards shared with his friend Brongniart. To his nomination we owe an herbarium of the French flora, and a separate collection of all the European species. Well aware of the importance of this immense collection, the mere nomenclature of which requires great labour and much time, he devoted to it every moment which he could spare from his professorial duties. I delight to recall the discussions which were raised by any specimens which displayed peculiar anomalies, or when an unknown genus came into view; it was on such occasions that M. de Jussieu invariably displayed all his acumen and amiability, and stimulated his hearers to seek, each by his own process, the solution of the difficulty. When nominated a member of the Central Society of Agriculture, M. de Jussieu did not cease to share in your labours; and you cannot have forgotten that Eloge on Augustin Sægeret, which, delivered with a voice enfeebled by sickness, will yet dwell on your minds, as the production of a talented writer, combined with a keen discrimination of facts and all the warmth of a man of the kindest affections.

And this leads me to speak of the private character of M. de Jussieu, as an upright and valuable citizen, an excellent father, and a truly

good man. Among his domestic friends, the most intimate were M. J. J. Ampère and Dr. Roulin, with whom he gave free scope to the benignity of his disposition and his affectionate heart.

A cousin, to whom he was fondly attached, and with whom he had passed many of his early childish years, became the object of his matured preference. She was Mademoiselle Félicie de Jussieu, and on the estate of an uncle, M. de Sennevièrs, among the mountains of the Lyonnais, their intimacy had ripened. He married her in September, 1827, and their mutual happiness was increased by two children; when alas! very shortly after the birth of the second, M. de Jussieu became suddenly widowed. There are griefs which cannot be described, and afflictions which are never overgot. Such was M. de Jussieu's case: he was supported by that well-founded hope of a reunion with his lost partner in a better world which can alone impart strength to endure the trial aright. His parents had, by precept and example, instilled religious principles into him, and he had profited by their teaching; but he never sought to make a second marriage: to the welfare of his offspring, two daughters, he henceforth devoted himself, and he had hardly seen them settled in life when he was taken from them.

Nature had endowed him with those qualities which give grace to superior abilities, and deprive them of the tendency to excite envy: his disposition was benevolent and gentle, yet firm; his heart was warm, and his affections susceptible. In general appearance he was far from striking, and his rather peculiar countenance was less engaging than might have been expected, owing to the smallness of his eyes; while his own timidity prevented others from feeling, at first, quite at ease in his society. But he no sooner began to speak than this impression vanished: his animated, witty, full and kindly conversation, graced with striking and appropriate anecdotes, quickly did the speaker justice, and conveyed such an impression as was never erased from the hearers' minds.

M. de Jussieu was singularly devoid of ambition: he cultivated botany with great success, and to his own unfading honour; true, but he did so for its own sake, because he loved the science, and because his fathers had loved it before him. Fame and high office came to him unsought. The desire for notoriety, which rarely repays the anxiety it occasions, never agitated him; he belonged to that body of learned men who confine their activity and their desires to the promotion of useful labours.

M. de Jussieu had long experienced the symptoms of his mortal malady, but he knew neither its origin nor its alarming nature. The process of digestion caused him such pain that he was often compelled to rest, after his meals, for many hours, stretched on a couch; but it was then that his mind was fully occupied: he used to read and to meditate. His lamp-lit library, seen by night, was to the inhabitants of the Museum what Bossuet's early candle had been to the people of Meaux, who used to speak of "*My Lord's Morning Star*," an emblem of unwearying industry. Medicine was powerless: ever since the close of 1852 it became evident that the illustrious botanist was the victim of a malady which no human power can arrest. Himself, alone, seemed to ignore the fact: he pursued, while almost overpowered with pain, those labours which he had carried off so lightly when in health; duty still found him at his post as a Professor, and, like the Emperor Marcus Aurelius, he seemed determined to die standing; but his powers betrayed his will, and he was compelled to give up work. Long, long hours of agony made great demands on his firm courage, but however violent were the attacks of disease, his patience was equal to the call: he never complained, but showed himself as firm against pain as he had done against the intoxication of prosperity. I must be allowed to allude to the tender care which was lavished upon him by his son-in-law, M. Ramond, who was all to him that an own son could have been. M. de Jussieu expired on the 29th June, 1853, and universal was the regret felt for his death. The Museum and the Institute lost one of their most illustrious members, the Society of Agriculture its chief ornament, and France a popular and distinguished name, closely connected with those of De Buffon and Cuvier. The glory is exclusively scientific: it owes nothing to striking views and a majestic style, like that of De Buffon, nor does it appeal to the imagination, as in the case of Cuvier, which seems to suggest the resurrection of a defunct world; but it is based on discoveries no less important, for it is founded on ever-during truths, viz. the subordination of characters in created organizations, and their distribution into those natural Families, with which will be for ever connected the illustrious name of De Jussieu.

Additional Note on Arachis hypogæa; by GEORGE BENTHAM, ESQ.

In the year 1838 a short paper of mine was read before the Linnæan
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Society, on the structure and affinities of *Arachis*, in which I pointed out the curiously imperfect achlamydeous female flowers from which the fruits are produced, whilst the apparently perfect hermaphrodite flowers are, generally speaking, if not always, barren, and I showed a closely similar structure and fructification in *Stylosanthes*, next to which I proposed to place *Arachis* among *Hedysarææ*. This paper was published in the eighteenth volume of the 'Linneæan Transactions,' a work which is unfortunately far too expensive and bulky to have any circulation among foreign botanists. The conclusions I had come to became known to them only by abstracts contained in botanical journals or other compilations, unaccompanied by the observations from whence they had been deduced; and my proposal for associating *Arachis* with *Hedysarææ* has been more than once treated as absurd, without however any facts or arguments being brought forward in opposition. Recently again a writer in 'Silliman's American Journal,' Mr. Hugh M. Neisler, whose article is reproduced in the last number of 'Taylor's Annals of Natural History,' adduces some observations of his own in support of a denial of the existence of the two kinds of flowers in *Arachis*, although he also had not seen my paper, the details of which would probably have led him to perceive his mistake. At the time I wrote it I had only had dried specimens to examine, but these were numerous and good, belonging to several species of *Arachis*, and to about twenty species or marked varieties of *Stylosanthes*. I have since then repeatedly examined dried specimens of both these genera, as well as of *Chapmannia*, and have observed *Arachis hypogæa* in a living state, especially in the summer of 1853, when I had the opportunity, in the Botanic Garden at Leipzig, of rooting up and carefully examining several plants of that species, bearing a profusion of flowers of both kinds, in various stages of development. These flowers always appear several together, in short, close spikes, in the axillæ of the leaves. In the upper axillæ, the barren but apparently perfect flowers are the most numerous; but even these are generally accompanied by one or more of the minute fertile ones, and the latter, which are always without calyx or corolla, become more numerous in the lower axillæ. The withered perfect flowers remain long sticking about the spike, and may sometimes be found apparently adhering to (but not connected with) the point of the fertilized ovary of the female flower, and borne along with it as its stipes lengthens, as mentioned by Mr. Neisler; but I always find within the tube

of these withered flowers their own dried up, barren ovary, with its unfertilized ovules, and if Mr. Neisler will compare these barren ovaries with those of the female flowers before the stipes has lengthened above a line or two, he will find the latter very different in shape, smaller in size, with a small sessile stigmatæ, wholly incompatible with the supposition of its ever having borne the long filiform style of the barren ones. The presence of imperfect flowers, deprived of corolla and even of calyx, but more prone to form their seed than the more showy and perfect ones on the same plant, is a phenomenon of not unfrequent occurrence among *Leguminosæ*, especially in several genera of *Phaseoleæ* and *Hedysarææ*, and has also been observed in other Natural Orders, such as *Cistineæ*, *Violaceæ*, *Malpighiaceæ*, etc.

The Government Botanist's Report of his Journey from Melbourne to Omeo in the Australian Alps, dated Omeo, 16th December, 1854.

Leaving Melbourne on the 1st of November, I travelled through the Fern-tree Gullies to the La Trobe River, and thence to the Avon, and ascended Mount Wellington from the ranges of the latter stream on the 14th of November. The altitude of this mountain appears to me more than 5000 feet, a snow-storm lasting here, even at so advanced a season, for a whole day. The main journey to the central part of the Australian Alps I commenced again from the Avon on the 22nd of November, proceeding to the Mitchell River, and thence to the Dargo. Following along the scrubby ranges between this river and the Wentworth, I crossed the Dividing Range between the waters of Gipps Land and those of the Murray River near the upper part of the Cabongra. Thence I traversed a grassy table-land in a north-easterly direction along the Cabongra downwards, until the country appeared practicable, towards the north, to reach the highest part of the Bogong Ranges.

The ranges hereabouts, which never before have been traversed by civilized men, are generally fertile, and timbered with the mountain White Gum-tree (*Eucalyptus phlebophylla*).

On the 3rd of December I ascended the south-eastern of the two highest mountains of the Bogong Range. In its upper regions even the vegetation of bushes ceases, the slightly arched summit being covered with alpine grasses and herbs. About noon I ascertained the boiling-water point to be 198°, according to Fahrenheit's thermometer,

and 75° according to Réaumur's scale. I am at present unable to calculate from this the barometric height and approximate altitude of this mountain, but I believe that it will be found nearly 7000 feet above the level of the sea. The much more abrupt and yet higher summit of the north-western mount I ascended from the Upper Mitta Mitta, which skirts its base, on the 6th of December. The boiling-water point I observed again to be 198° Fahr. (although the elevation of this mountain is unquestionably higher, to the extent of several hundred feet), a circumstance owing to the greater atmospherical pressure of that day. The observation was instituted during the afternoon about three o'clock. On both these mountains mighty masses of snow lay far below the summits, lodging chiefly in the ravines, and these never melt entirely under the heat of the summer sun.

Considering that mountains of such altitude, probably the two highest in the Australian continent, deserve distinctive names, I solicit his Excellency's permission to name the grandest of both Mount Hotham, and the second in height Mount La Trobe, as I trust to be entitled to the great honour of being the first man who ever reached these commanding summits of the Australian highland. The sky being fortunately clear during the ascent of Mount Hotham, I enjoyed a most extensive and unrestricted view over the Alps, and I did not lose this opportunity of taking bearings over to some of the principal mountains already included in the trigonometrical survey of Australia. From Mount Hotham bore Mount Aberdeen (the southern peak in the Buffalo Ranges) W. 10° N., the most northern peak of the same range W. 30° N., Mount Buller W. 35° S., Mount M'Millan (of Townsend, or Castel Hill of Tyers) due S., the Cobboras Mountains (between Omeo and Maneroo) E. 12° N., Mount Wellington S. 10° W., Mount La Trobe (distant about eight miles) S. 25° E. Further bearings were made to Mount Leichardt E. 30° N., to Mitchell's Plateau (in about equal distance with Mount Buller) S. 40° W., to Kennedy's Height (a rocky hill in the snowy table-land, and about six miles distant) E. 5° S., to Hooker's Plateau (about fifteen miles distant) N. 25° E. The bearings from Mount La Trobe were as follows:—Mitchell's Plateau S. 15° W., Mount Aberdeen W. 5° S., Clarke's Peak (between Mitchell's Plateau and the Buffalo Ranges) S. 30° W., Mount Hotham N. 25° W.; Mounts Buller, Wellington, M'Millan, and other mountains, were concealed in clouds. I hope that these bearings, although only taken with a simple

pocket-compass, will be found sufficient and correct enough to fix the position of these mountains until an exact survey of this interesting part of the country will be performed. The signification "Bogong Range" ought to be abandoned, as the natives apply it to any of the lofty mountains when in the fissures of the rocks, chiefly when covered with the spreading Alp Pine (*Podocarpus montana*), the Bogong moth occurs. One of the main branches of the Mitta Mitta has its sources at Mount La Trobe, and those of another, as well as those of the Ovens and Mitchell, lay in a lower range not far distant. This snowy highland is in many places well grassed, and the lower parts of it will be doubtless occupied as cattle runs as soon as the discovery of a workable gold-field opens this part of the Colony. The prevailing rock is sandstone, often accompanied by slate and quartz. Granite is comparatively rare.—After extending my journeys over several mountains in the neighbourhood, and an exploration of the Upper Mitta, I went over a generally fertile country to Omeo.

The amount of additional plants for the Flora of Victoria, obtained during this part of my expedition, is nearly sixty species, comprising the following genera:—*Emea*, *Drosera*, *Chatospora*, *Gastrodia*, *Styloneurus*, *Lecanora*, *Chorysanthes*, *Cassia*, *Pomaderris*, *Plantago*, *Lepidosperma*, *Decaspora*, *Astelia*, *Schidiomyrtus*, *Ranunculus*, *Veronica*, *Eurybia*, *Leucopogon*, *Patersonia*, *Grevillea*, *Pleurandra*, *Ionidium*, *Barbarea*, *Calystegia*, *Viola*, *Hypnum*, *Myosotis*, *Cryptandra*, *Erysimum*, *Prasophyllum*, *Carex*, *Ozothamnus*, *Pentachondra*, *Jungermannia*, *Boronia*, *Haplopappus*, *Stackhousia*, *Pimelia*, *Bryum*, *Bartramia*, *Hedwigia*, *Oreobolus*, *Bellendenia*, *Alchemilla*. Several of the species are perfectly unknown, and nine of the genera, and one Natural Order (*Asteliaceæ*) were previously also not represented in this Colony.—It is my intention to proceed without delay from here to the Cobboras, thence to Maneroo and the Mungang Mountains, by which excursions the botanical examination of the Australian Alps will be completed.—FERD. MUELLER.

BOTANICAL INFORMATION.

Charles Andreas Geyer.

[From a letter of Dr. H. G. Reichenbach to Dr. J. D. Hooker, we

extract the following obituary of one whom we formerly numbered amongst the contributors to this Journal.—*Ed.*]

“Charles Andreas Geyer was born at Dresden, in Germany, on the 30th of November, 1809. His father, a market-gardener of very moderate means, could devote but little time, and still less money, to the education of his son; but the natural abilities of the boy excited the attention of a kind-hearted Cantor, Mr. Mark, who caused him to be instructed in Latin. Under the well-known equestrian statue of Augustus the Strong, at Dresden, young Geyer was wont to sit, selling the produce of his father's garden, and at the same time endeavouring to master the difficulties of the new language. In 1826 he entered the Garden at Zabelitz as apprentice; in 1830 he again removed to Dresden, where he was engaged as assistant in the Botanic Garden and other horticultural establishments. At that time Geyer had a numerous circle of friends, amongst whom was Professor Reichenbach, my father, for whom he always entertained a high regard, and whose lectures on botany he attended with great regularity. Every one seemed to like the promising youth, a circumstance for which his extremely prepossessing appearance, his simple, pleasing manners, may in a great measure account. I was at that time quite a child, but I still remember his handsome features. He was active,—a capital swimmer, an excellent pedestrian.

“In February, 1834, he left Dresden for North America, to satisfy his thirst for exploring new countries. There his life was a very chequered one. During the summer months he used to collect plants; during the winter he was employed in various ways; at one time he entered a printing-office as compositor, and, always ‘going ahead,’ he wrote, a few months afterwards, the leading articles for the very newspaper the type of which he had, a short time before, assisted in putting up. The first great journey Geyer made was in 1835, when he visited, with a single companion, the plains of the Missouri, where he received very ill treatment from the hands of the Indians, and whence he returned with broken health to New York. In 1836 and the following years he accompanied Mr. Nicollet on his surveying expedition between the Missouri and the Mississippi. In 1840 he investigated the flora of St. Louis, where he became intimately acquainted with Dr. Engelmann. In 1841 he joined Colonel Fremont's expedition to the Desmoine river, in the Lower Iowa country. In 1842 he explored the territory of Illinois, and in 1844 went with Sir W. Stewart to the Oregon ter-

ritory. The influence of Sir William secured to Geyer a warm reception in the different forts of the Hudson's Bay Company, and enabled him to turn this journey to the greatest advantage. In the 'London Journal of Botany,' vol. iv. p. 479, Geyer has given an account of this interesting expedition, and shown how well he understood describing the various regions through which his march led him. On the 13th of November, Geyer left Vancouver's Island, and touching at the Hawaiian group, he reached England in May, 1845, where he remained several months, residing at Kew, to arrange his collections of plants and other objects of natural history. In the following September he returned to Dresden. He looked at least twenty years older. Not being able to obtain a suitable situation, he bought a piece of ground at Meissen, and commenced a nursery. In leisure hours he gave lessons in systematic botany and the English language. During the last three years of his life he edited 'Die Chronik des Gartenwesens,' a horticultural journal, which obtained considerable influence through its well-written leading articles, almost all of which emanated from the pen of Geyer himself.—On the 21st November, 1853, he breathed his last, deeply lamented by all who knew him."

On Beech Oil; by WILHELM E. G. SEEMANN.

Amongst the various kinds of oil used in Northern Germany, especially the kingdom of Hanover, for culinary purposes or as materials of combustion, that extracted from the nuts of the Beech (*Fagus sylvatica*, Linn.) is, on account of its numerous good qualities, deserving of notice. Beech-oil does not play a prominent part in commerce, nor is it likely to do so, owing to the fact that it cannot be procured in large quantities; the country-people who collect the nuts, or cause them to be collected, use the greater part of the oil extracted from them in their own household, and only dispose of the remaining fraction. This is the reason why it is impossible to give even a rough estimate of the quantity annually produced. About Hanover the nuts are gathered towards the end of October or the beginning of November; this is done either by picking up by hand those which have fallen to the ground, or by spreading out large sheets under the trees and beating the branches with poles, so as to cause the nuts to separate from them. The latter process appears, at first sight, the least expensive; but as the good nuts have

to be separated from the bad (abortive) ones, it is found on closer examination to be just the contrary. In 1854 about 25 lbs. of nuts sold in Hanover for eighteenpence; 25 lbs. yield about 5 lbs. of oil, 1 lb. selling for about sevenpence. The oil is of a pale yellow colour, and has an extremely agreeable taste. It is often adulterated with Walnut-oil; the latter is even sold as Beech-oil, and that may account for the difference of opinion entertained respecting the quality of the Beech-oil. The townspeople use it chiefly as salad oil, but the peasantry employ it generally as a substitute for butter, etc., and only when there has been a good harvest of nuts, for burning in their lamps. The husks (*epicarpia*) are, after the oil has been expressed, made into cakes about nine inches square and one and a half inch thick; these are used for combustibles, and not given, as some people imagine, as food to cattle.*

The FERNS of WALES; by EDWARD YOUNG.

We are glad to be able to announce the speedy appearance of a work illustrated by well-dried specimens of thirty-five species of *Ferns* of the Principality of Wales. "It is presumed," the author says, "that there are forty-one species in the United Kingdom, so that with the exception of six, which are found in few localities, this work will present a valuable collection of nearly all the Ferns, many of them rare, which are found in the British Isles. The descriptions, in letterpress, will be simple and lucid; and instructions will be given for the cultivation of each Fern, to which will be added a list of the Welsh localities. Fine specimens in good fructification will be given, and great care will be taken in drying and setting them up.

"The size of the work will be sufficient to contain specimens of the largest species. It will be elegantly got up and carefully bound, the title-page being illustrated with a photographic view of one of the waterfalls in the Vale of Neath.

"Persons wishing to become subscribers can apply to the author, Mr. Edward Young, Neath, Glamorganshire."

* Both the oil and the cakes alluded to are exhibited in the Museum at Kew.—
EDITOR.

NOTICES OF BOOKS.

HEYFLEUR, LUDOVICUS, *Eques de; Specimen FLORÆ CRYPTOGRAMÆ Vallis Arpasch Carpatæ Transylvani.* Vienna. 1853. Imp. folio. (Coloured plates, executed in Nature's printing, "Naturselbstdruck.")
The FERNS of Great Britain and Ireland; by THOS. MOORE, F.L.S.; edited by JOHN LINDLEY, Ph.D., F.R.S., etc. Imp. folio. Part I. Nature-printed by Henry Bradbury. London. 1855.

It was, we believe, early in 1853 that M. Louis Auer, of the Imperial Printing Office at Vienna, was stated to have patented a process, invented by himself, in conjunction with Mr. Andrew Worrington, overseer of the same establishment, "for creating, by means of the original itself, in a swift and simple manner, plates for printing copies of plants, lace, etc., containing the most delicate profundities or elevations, not to be detected by the human eye." In a pamphlet published at Vienna, Mr. Auer further relates:—"If the original be a plant, a flower, or an insect, a textile or in short any lifeless object whatever, it is passed between a copper plate and a lead plate, through two rollers that are closely screwed together. The original, by means of the pressure, leaves its image impressed with all its peculiar delicacies—with its whole surface, as it were—on the lead plate. If the colours are applied to this stamped lead plate, as in printing a copper-plate, a copy in the most varying colours, bearing a striking resemblance to the original, is obtained by means of *one single impression* of each plate. If a great number of copies are required, which the lead-form, on account of its softness, is not capable of furnishing, it is stereotyped in case of being printed at a typographical press, or galvanized in case of being worked at a copper-plate press, and the impressions are taken from the stereotyped, or galvanized plate, instead of from the lead plate."*

* See 'Athenæum' for 1853, p. 1433. At p. 1486 of the same year of the 'Athenæum,' Messrs. Bradbury and Evans assure us that "as far as Austria is concerned, this invention was first brought into use by Mr. Worrington, in 1852, but that in the year 1851, Mr. Ferguson Branson read before the Society of Arts a report of a process identically the same as that claimed by the Austrian patentees, and even produced printed specimens to illustrate more fully the true meaning of this invention." These gentlemen (Messrs. Bradbury and Evans) go on to say that the process, for the introduction of which into this country they have taken out a patent, is in many particulars a material improvement upon Mr. Branson's invention, as well as upon that in use at Vienna.

The publication of this pamphlet was soon followed by the first of the two works which stand at the head of this notice. An early and very splendid copy was sent by His Majesty the Emperor of Austria to the Foreign Office of our country, and by Lord Clarendon, Chief Secretary for Foreign Affairs, presented to the Library of the Royal Gardens of Kew. This is indeed a charming work, yet, as far as the plates are concerned, of unequal execution, as was to be expected if the nature of the process is considered. Few who are fond of plants, and who are not artists themselves, but have, at some period or other of their lives, taken off impressions of *neatly pressed dried* plants, and especially of leaves, by dabbing them with printer's ink, which the nerves and other *prominent* parts take up, and transferring all their lines and figures upon a piece of paper, as if we were printing from a wood engraving. We possess a folio volume of plants executed in India in this manner, and in proportion to the nature of the surface, so is the fidelity, or rather the clearness and distinctness, or the reverse, of the plant. If the leaves were thin and conspicuously nerved, the form and nervation would come off well: but if these sprang from a rather stout woody branch, the branch would give a blurred impression, and the portion of the leaves, prevented from coming in contact with the paper by the projecting surface of the branch, would necessarily give no impression at all; you have only half a leaf, or three-quarters of a leaf, as the case may be; and in regard to the flower, injured as it must be by pressure, especially a cluster of flowers, it is hopeless to expect anything intelligible from the transfer of the inked surface of that to paper. It is not capable of giving a clear impression. Now it is the same, or nearly the same, in *nature printing*: only that you print from a *cast* of your specimen, and you consequently fill the *impressions* with ink (as in a copper-plate); and though your branch or stem may be *thicker* than the leaves (but there is a limit to that), you can print the two by giving a greater quantity of ink to the former; and your stem or branch will be prominent in proportion, *i. e.* raised on the paper, so that its form is sensible to the touch. Whatever affords a *clear and distinctly marked yet moderately raised surface* on your plant, the same will be transferred to the paper:—but so faithful is the transfer, so true to *nature* (if we may use the term for our dried and compressed plants, which have been so often condemned as the opprobrium of nature), that wherever there is an indistinctness or confusion of parts, as in the case

of clusters of flowers and fructifications generally, or leaves lying one over another, there will be the like obscurity in the impression.

Whatever may be the superiority of Mr. Bradbury's process over that in use at Vienna, we are not sensible of it in the instance of the work that stands second at the head of this notice; and we must maintain that Mr. Heyfleur's work on the Carpathian Cryptogams and Mr. Moore's on the British Ferns (as far as it has yet gone) are both very beautiful, and the more so because the authors have the good sense to select the kinds of plants best suited to the process; and they are both entitled to very high commendations. In the Cryptogams of Mr. Heyfleur there is a variety and richness of colour which adds greatly to the effect, and the forms are quite as graceful as the Ferns. We think nothing can be more true to nature, in colour as well as form, than the *Cladophora insignis*, Ag., Tab. 1. It seems the plant itself. *Sticta pulmonaria*, L., on the other hand, wants colour and filling up. At Tab. 3, *Agaricus androsaceus*, L., is a blot, only showing form: and the other figures, *Fungi*, *Lichens*, and *Algæ*, are good, in proportion as the specimens bear compression without losing their characteristic features. Tab. 4, the *Jungermanniæ*, are extremely beautiful. The rest of the plates are Mosses, and are excellent, except the capsules, which, true to their originals, exhibit them bruised and crushed by pressure. The last plate of the noble specimens of *Meesia triquetra* and *Mnium ligulatum* would deceive an experienced Muscologist.

In the 'Ferns of Great Britain and Ireland,' the only two species represented (on three plates) are *Polypodium vulgare*, with its varieties, and, in our copy at least, *P. Phlegopteris*; and here, in all the fronds, and there is no stinting of specimens on the noble pages, the greens are of the same unvarying pale, somewhat verdigris cast, happily a good deal relieved by the deep brown of the caudices and roots. As the art is a new one, and no doubt capable of improvement, we may be permitted to say that the depth of surface-green on the fronds is insufficient, so that they have too much the character of what are usually called skeleton leaves; the nervation is of too prominent a character, and the parenchyma wants substance; the green of it is of the same filmy nature as seen in some of the more delicate hymenophylloid Ferns. If this deficiency be not remedied in the species of *Polystichum*, especially when the upper surface requires to be represented, the effect will be more injurious than in the present plates.

Notwithstanding the defects we have ventured to mention, arising perhaps from the present imperfect nature of the process, we are sure there are few botanists, especially Pteridologists, who will not think the present a most acceptable publication, and that our acknowledgments are due alike to Dr. Lindley and Mr. Moore and Mr. Bradbury for the respective parts they have taken in it. Judging from the specimen of the descriptions, Tabs. I., II., III. (all devoted to the well-known *Polypodium vulgare*), that department is carefully and well executed by Mr. Moore. The preface is from the pen of Dr. Lindley. We look for the continuance of the work with great satisfaction.

Part II. of this fine work has just reached us, with its three plates, viz.—Plate III., *Polypodium vulgare*, vars. *Cambricum* and *crenatum*; Plate V., *Polypodium Dryopteris*; and Plate VI., *Polypodium Robertianum*, Hoffm. (*P. calcareum*, Sm. and most authors, save those who consider it, and probably with much justice, a variety of *P. Dryopteris*). English authors who adopt this name of Hoffmann do not seem to be aware that it appears under that name in the Fl. Germ., only in the unpagged *Addenda et Emendanda** (not at “p. 10 of vol. ii.”). And as it is, further, not included in the index of that work, there is ample excuse for Smith and succeeding authors being ignorant of its existence; add to which, the specific character of Hoffmann is miserably unsatisfactory, and does not give one single point of distinction between it and *P. Dryopteris*; so that, in our opinion, it would have been better to have left it in its original state of obscurity. Be that as it may, the portrait of the plant in the work before us is an admirable one, only wanting in what this style of “printing” is sadly deficient, viz. the glands and pubescence. Setting aside the glands and pubescence (and we know that in many other Ferns their absence or presence affords no *specific* distinction), we appeal to these two figures of *P. Dryopteris* and *P. calcareum*, “Nature’s own printing,” and ask if

* It is true that Mr. Moore quotes, as it were, another work of Hoffmann, ‘Flora de l’Allemagne,’ in addenda (1795), giving no volume. We are ourselves ignorant of any work of Hoffmann bearing that title; but Pritzel explains the matter, and lets us into a secret. “Adest,” says Pritzel, “*etiam titulus gallicus (et anglicus ?)*: ‘La Flore de l’Allemagne, ou Etrennes Botaniques.’” The work which is generally quoted under the title of ‘Deutschlands Flora,’ in my copy, probably to suit the more scientific market, has ‘Flora Germanica’ for its only title. The first volume, in two parts, bears date, Part I., 1800, Part II., 1804 (being a second edition); the second volume (*Cryptogamia*) is dated 1795, and seems never to have gone to a second edition; it is in the addenda to this that the Fern in question appears.

there is any tangible feature by which they can be separated as species? or any characters which would not in other cases be considered mere modifications of one and the same form?

On the Affinities of the Genera VAVÆA, Benth., and RHYTIDANDRA, Gray; by PROFESSOR ASA GRAY, of Cambridge University, Boston, U.S. Communicated to the American Academy of Natural Sciences, October 10, 1854.

In this paper Dr. Gray has ably discussed the affinities of two very obscure plants belonging to the Polynesian Flora, and of which imperfect specimens only had hitherto been described. Of these, *Vavæa* (after the Island of Vavao, one of the Friendly group), was discovered by Mr. Hinds, and first described by Bentham (Journ. Bot. vol. ii. p. 212), but from too incomplete data to admit of its immediate relationship being discovered. The same plant was afterwards gathered by the officers of the United States Exploring Expedition, and more fully described by Gray in the Botany of that Voyage (vol. i. p. 244, t. 16), where it was appended to *Meliaceæ*, notwithstanding its stamens being incompletely united, and double or triple the petals in number. Additional specimens from the same sources now enable Dr. Gray to show that the anomalies in question are mainly due to the flowers being polygamous, and that the fruit is entirely conformable to that of the Tribe *Trichilieæ* of *Meliaceæ*.

In some observations appended to this genus, Dr. Gray proceeds to discuss the affinities between *Meliaceæ* and *Styracææ*, the subject being suggested by the circumstance of Mr. Rich, the botanist to the Expedition, having ticketed and figured *Vavæa* as a species of *Styrax*; and he adds some remarks upon Mr. Miers' proposal to separate *Styrax* widely from the *Symplocineæ*, whilst that author ignores any affinity between *Styracææ* and *Meliaceæ*, and includes *Pamphilia* and *Faveolaria* in the former. In some copious notes (whose number and length however tend to involve this very obscure and important subject) Dr. Gray discusses all the points of fact and theory upon which he differs from Mr. Miers, displaying a perfect familiarity with the Natural Orders in question, and with the structure and anatomy of their contained and allied genera, and a sagacity in interpreting their characters and revealing their affinities which is quite admirable.

Rhytidandra is a Feejee Island shrub, described by Dr. Gray in the Botany of the United States Exploring Expedition (vol. i. p. 302, t. 28) from imperfect specimens, and there doubtfully referred to *Olacaceæ*; a reconsideration of its characters however now induces him to refer it to *Alangieæ*, a group with which he was previously only partially acquainted. In the remarks that follow, Dr. Gray is embarrassed by two important errors that have crept into systematic works, namely, the attributing to *Marlea* a convolute aestivation of the corolla, and stamens united in pairs, with the anthers connate into a tube. After explaining away the obstacles to the alliance of *Rhytidandra* with *Marlea*, which these anomalies would present, and indicating collateral affinities through *Nyssa* and *Mastixia* to *Corneæ*, Dr. Gray adds a postscript, detailing a subsequent examination of *Marlea*, in which he finds the corolla to be valvate, and the filaments and stamens free. This confirms the position of *Rhytidandra* in *Alangieæ*, which he agrees with Brown in considering a section of *Corneæ*.—The whole paper is that of a master in Botany; but it would have gained much in lucidity had the notes been incorporated with the text.

PRITZEL, DR. G. A.: ICONUM BOTANICARUM INDEX *locupletissimus*.

One thick vol. Imperial 8vo. 1184 columns. Berlin. 1854.

Dr. Pritzel has rendered good service to the cause of Botany by the publication of his very useful 'Thesaurus Literaturæ Botaniciæ omnium Gentium,' etc., which has been more than once noticed in the pages of this Journal, and he has laid us under further obligations by the publication of the present equally laborious work. It is, as the title implies, an *Index to Botanical Plates*, the whole arranged alphabetically; and, as far as we can judge, it appears to be done with much care and accuracy. But in order to discover the figure, it is necessary to know what name it bears in the work itself. For example, if it is desired to know where *Villarsia nymphæoides* is to be found, you must seek it under that name for reference to 'Fl. Lond.,' 'Baxter, Brit. Bot.,' 'Sturm's Flora,' 'Dietr. Fl. Bor.,'—and under *Menyanthes nymphæoides* for the references to 'Fl. Dan.,' 'Engl. Bot.,' 'Gærtner,' and 'Lamarck' (by some error, probably, it is quoted in 'Sturm's Flora' under *both* names). Here are no synonyms, as in 'Steudel's Nomenclator.'

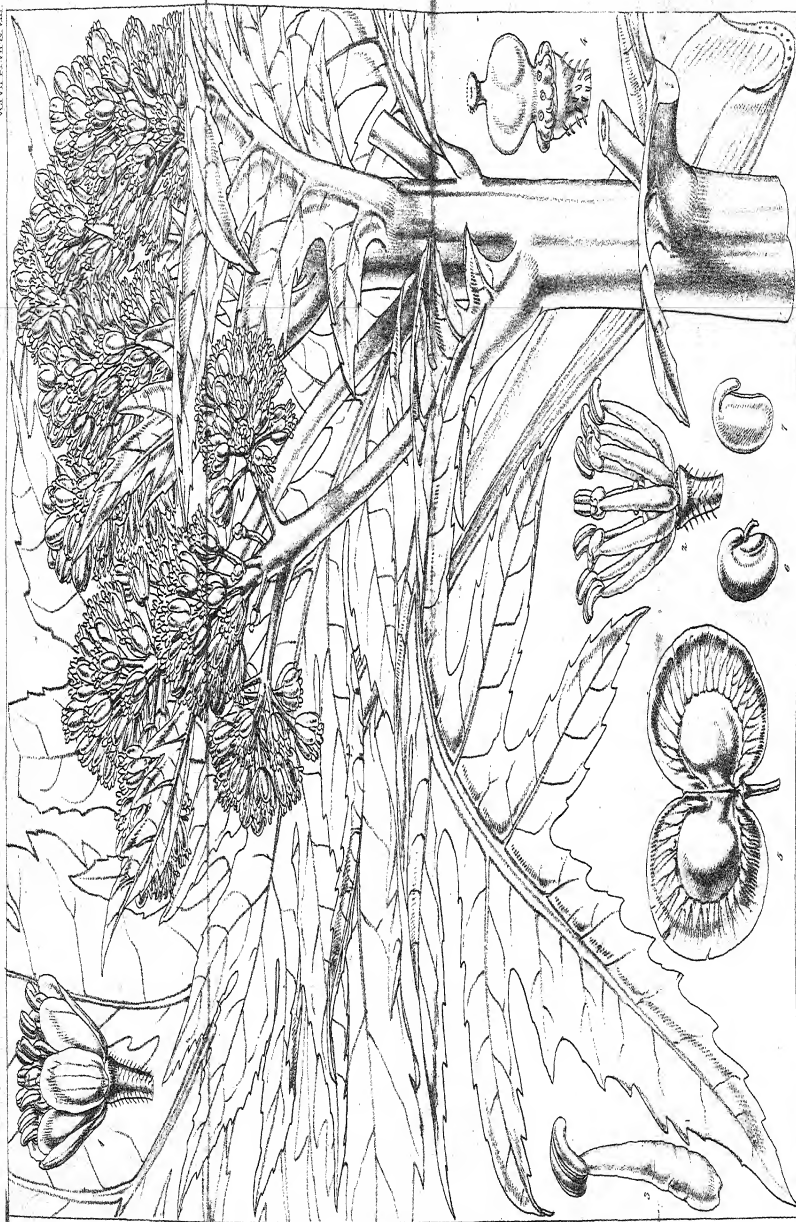
The work embraces all phænogamous plants, and the Ferns, among *Cryptogamia*; but unfortunately, with the exception of Rheede, Rumph, and Kæmpfer, no authors are taken up till after the time of Linnæus, and we have no references to the numerous Fern-plates—and excellent ones for their day—of Plumier, etc.; and heartily do we wish that our author may yet publish a work to include all the *Cryptogamiæ*, of which the figures are numerous and important.

The editors of the excellent 'Bulletin de la Société Botanique' (i. p. 347) observe, "Cette *Index* permet de comparer le rapport actuel de l'iconographie botanique avec le nombre des plantes décrites, et l'on trouve que malgré toutes les grandes et nombreuses publications illustrées, les Jardins, les Magasins, Recueils, etc., l'iconographie est fort en retard. Quelques rapprochements pris au hasard le prouveront de reste. Le dernier recensement du genre *Acacia*, inséré par M. Benthams dans le *London Journal of Botany* de 1842, contient 401 espèces. M. Pritzel n'a pu en citer que 158, et encore dans ce nombre il y a des doubles emplois, à cause des noms multiples de plusieurs plantes. L'*Enumeratio Plantarum* de Kunth comprend 373 *Cyperus*, dont 90 simplement ont été figurés. Le même ouvrage indique 159 *Dioscorea*, parmi lesquels 24 seulement ont été reproduits par la gravure. Le travail de Vogel sur le genre *Cassia* en signale 304, dont 93 seulement sont figurés. Dans le *Prodromus*, on peut compter 282 *Ipomœa* pour 119 figurés, 94 *Gomphrena* pour 28, 171 *Cestrum* pour 33. Le *Synopsis Glumacearum* de M. Steudel, en cours de publication, énumère 459 espèces du genre *Andropogon*, pour lesquelles M. Pritzel n'a trouvé que 42 figures. Il compte 143 *Bromus*, dont 73 seulement sont illustrés; 105 *Danthonia*, dont 20 mentionnés dans l'*Index*, etc. Il est à remarquer que les genres les plus nombreux sont les moins riches en figures, et cependant ce sont ceux pour l'étude desquels le secours de l'iconographie est en quelque sorte indispensable." This is quite true, and shows clearly that there is a fashion in Botany, and especially in Horticulture, the latter of which has had so much influence on botanical Iconography; and that not those which most require illustration, such as the *Grasses*, *Cyperaceæ*, *Dioscorea*, *Gomphrena*, *Cestrum*, etc., are most in demand, but such as recommend themselves by their *beauty* (though that is too much influenced by public caprice), so as to justify an author or publisher's embarking in such an undertaking without risk.

PARLATORE, M. PH. : *Mémoire sur le Papyrus des ANCIENS, et sur le Papyrus de Sicile.* Paris. 1853. 4to. Plate.

We are only now in possession of this interesting Memoir of Professor Parlatore, intended to show that the *Papyrus* of Sicily, previously always considered (by Linnæus as well as others) the *Papyrus* of the ancients, is in reality specifically distinct. He was led to this investigation by an examination of Nubian specimens, gathered in 1844, by M. le Chevalier Figari, of Cairo, and which, together with a rich collection of Egyptian and Ethiopian plants, are deposited in the Herbarium of the Museum of Natural History at Florence; and he came to the conclusion that the Sicilian plant was introduced into Sicily, probably from Syria, a little before the tenth century, at the time of the dominion of the Arabs, and that the *Papyrus* of the Egyptians, now apparently almost lost to Egypt, is the same as that found in Nubia.

In Syria the Sicilian *Papyrus* (*Cyperus Syriacus*) is found at Munkalia, on the borders of the Mediterranean, seven hours' distance from Jaffa, and also abundantly near Acre and Sur (Tyre), where it is used for making mats, and between Kaiffa and Jaffa. Bruce's *figured* plant represents the Egyptian *Papyrus*, which he says he collected in "Syria, from the river Jordan; from two different places in Upper and Lower Egypt, from the Lakes Traña and Goodero, in Abyssinia;" and these he declares to be intrinsically the same, only "he thought that the plants of Egypt, the middle of the two extremes of country, were stronger, fairer, and fully a foot taller than those in Syria and Abyssinia." But Bruce had not an eye for botanical distinctions. The *C. Papyrus*, an Egyptian species, is a tropical plant, recognized by the rays of the umbel always being erect, so as to form a broom-like head, and the great length of the involucre; while *C. Syriacus*, Parl., is known by the greater length of the rays of the umbel, and their spreading so as to form a globose head, with the involucre short. The plant, we believe, invariably in cultivation in England is therefore the Sicilian or Syrian species, *C. Syriacus*. We have ourselves examined specimens from the Montpellier Garden (Professor Gouan), and native ones from the Congo, and from De la Goa Bay, South Africa, and these all prove to be the same as the Sicilian plant.



Note on the INDIA-RUBBER of the Amazon, by R. SPRUCE, Esq.*

The extraction of caoutchouc from the various species of *Siphonia* was, at the time of my arrival in Pará (July, 1849), a branch of industry limited to the immediate environs of that city, being carried on principally in the island of Marajó and about the mouth of the Tocantins. The low price it fetched in the Pará market (10 milreis—£1 3s. 4d. the arroba of 32 lbs.), and the great gains which those who trade in the sertão† expect on their outlay, prevented the sertanejos from employing themselves in the fabrication of seringá; to which contributed also the universal apathy and even antipathy to everything new, if it involved labour, no matter how profitable. When I ascended the Rio Negro in 1851, I pointed out to the inhabitants the abundance of seringá-trees they possessed in their forests, and tried to induce them to set about extracting the gum; but they shook their heads, and said it would never answer. At length the demand for India-rubber, especially from the United States, began to exceed the supply; the price consequently rose rapidly, until early in 1854 it reached the extravagant sum of 38 milreis (£4. 8s. 8d.) the arroba. This woke up the people from their apathy, and the impulse, once given, extended so rapidly and widely, that nearly throughout the Amazon and its principal tributaries, the mass of the population put itself into motion to search out and fabricate seringá. In the province of Pará alone (which now includes a very small portion of the Amazon) it was computed that 25,000 persons were employed in that branch of industry in the year 1854. Mechanics threw aside their tools, sugar-makers deserted their engenhos, and Indians their roças; so that sugar, rum, and even farinha, were not produced in sufficient quantity for the consumption of the province, the two former articles having to be imported from Maranham and Pernambuco, and the last from the river Uaupés.

The mode of obtaining the milk is almost universally by tapping.

* The name usually given to India-rubber on the Amazon is "Xeringue" (pronounced nearly *Sheringhy*). This is undoubtedly an Indian corruption of the Portuguese word "Seringa," a syringe or clyster-pipe, the fabrication of which was the first use to which the gum of the *Siphonia* was applied in its native country. In Lingoa Geral, *xeringue* is the common term for a liar (query, a *stretcher*?), but, as it has no affinity with any other word in the same language, it seems certain that it is of Portuguese origin. The Spaniards have adopted the term "Seringa," in which I follow them. The Indians of Venezuela call the rubber *yápi*, *dápi*, or *dápiche*.

† The Interior,—literally, "the desert."

Some who began by cutting down the trees, found that in this way they obtained much less milk than by successive tappings of the same tree, besides that the work was harder, and it was necessary continually to shift their sphere of operations. I am glad therefore that this killing of the tree to get at the golden eggs has been abandoned.

Most seringueiros follow the old mode of drying the milk by smoke, applied to successive coatings on a mould. Some have filled a small square box with the milk, and allowed it to coagulate; but, as the milk does not become solid until the end of ten days or more, and the mass then requires to be cut into thin slices, and subjected to heavy pressure (such as it is difficult to obtain here), in order to free it from the water and air collected in cells within its substance, this mode is by no means popular.

It is found that the addition of a small quantity of alum accelerates the coagulation of the milk. Ammonia has a contrary effect, and is accordingly useful when the milk is required to be kept some time in a liquid state.

When the trees are flowering, nearly all the milk goes to the nourishment of the flowers, and scarcely any can be obtained from the trunk, while if a panicle be wounded the milk starts out in large drops. It is customary to leave the trees untouched for a few months in the year, from the epoch of flowering until the fruit has attained its full size. About Pará, the collection of seringa seems limited to the dry season—June to December. On the upper Rio Negro, the seringa-trees flower from November to the end of January; and when I started from San Carlos on November 23rd, little milk was to be obtained.

The species from which rubber is extracted on the upper Rio Negro and lower Casiquiare are two, *Siphonia lutea*, Spruce (Journ. of Bot. vi. 370), and *S. brevifolia*, Spruce (3139 to Bentham); known respectively as the long-leaved and short-leaved seringa. The former yields most milk, but neither is so productive as the seringa of Pará (*Siphonia Brasiliensis*, Willd.). Both are straight, tall, and not very thick trees, with smoothish thin bark, and yellow very odoriferous flowers, while the other species have mostly purplish flowers. I suppose their average height may be about 100 feet. I cut down a tree of *S. brevifolia* near San Carlos which measured 110 feet. I first saw and gathered *S. lutea* in the mouth of the Uaupés; and as I came down the Rio Negro in December, 1854, I found a rancho erected on the spot, and a person

employed in extracting rubber from the same trees as I had taken the flowers.

Near the Barra, some milk is taken from a *Siphonia* common on the river-banks (*S. elastica*, Aubl. ?); but there is another species growing in the interior of the forest said to yield more milk. I have not seen it, and cannot say whether it is a species known to me.

The *Siphonia* most frequent about the mouths of the Tapajoz and Madeira seems to be *S. Spruceana*, Benth., but there are, no doubt, other species.

I have gathered, in all, some seven or eight species of *Siphonia* on the Amazon and Rio Negro, but it is probable that two or three times as many still remain to be discovered.

On the Uaupés, I met with two trees* of a genus apparently far removed from *Siphonia*,—possibly they are *Sapotaceæ*, for I did not analyse the flower, (*Micrandra*, Benth. in Journ. of Bot. vi. 371,)—which yield pure rubber, and are also called by the Indians *Xeringue*; but the clustered trunks (often as many as ten from a root) and the simple (not ternate) leaves, give these trees an aspect very different from that of the *Siphoniæ*.

There are doubtless several other trees in the valley of the Amazon which yield rubber, but in many cases mixed with resin, which we have not here the means of separating. Such are a great many Figs and Artocarps, two families which abound towards the head-waters of the Rio Negro and Orinoco. On the Casiquiare, the Indians make white shirts of the bark of an epiphytal Fig, which they call "marima blanca," the milk of which is said to be very copious, and when dry elastic. Towards the upper mouth of the Casiquiare I saw several trees of marima blanca, but they were perched high up on other trees, and had no flowers or fruit. Those who have herborized among mosquitos, ants, and wasps, will understand why I did not trouble myself to gather only a sterile branch.

In descending the Casiquiare, in January, 1853, I reached one even-ing a small village some distance above the outlet of Lake Vasiva—one one of those pueblos which spring up on the banks of the Rio Negro and Casiquiare, endure barely a generation, and then disappear—where I found nearly the whole population (Indians of the tribe Pacimonare) amusing themselves by a sort of football. Their balls seemed to be

* No. 2427 and 2479 to Bentham.

the inflated bladders of some large quadruped, such as the tapir; but on picking one up I found it to be India-rubber. I asked them to keep two or three balls for me when they had finished their game, and they promised to do so, but during the night they all got gloriously drunk and burst their balls. I did not see the tree from which this rubber was extracted, but from the description given me it was a true *Siphonia*, perhaps *S. lutea*.

In consequence of so many people devoting themselves to the fabrication of seringa, the value fell again more rapidly than it had risen, and by last advices from Pará, to date of February 1, 1855, seringa was down at 15 to 18 milreis the arroba.

RICHARD SPRUCE.

Barra do Rio Negro, Feb. 9th, 1855.

Description of some new Genera and Species of CEYLON PANGIACEÆ;
by G. H. K. THWAITES, F.L.S., Superintendent of the Royal Botanic
Garden at Peradenia. (TAB. VIII.)

Nov. Gen. TRICHADENIA, Thw. Nat. Ord. Pangiaceæ.

Char. Gen. Flores dioici. *Calyx* gamosepalus, integer, calyptræformis, apertus, denique irregulariter disruptus. *Corollæ petala* 5, hypogyna, imbricata. *Squamulæ* 5, lanceolatae, petalis oppositæ et cum iisdem dorso adnatæ, carnosæ, hirsutæ. *Fl. Masc. Stamina* 5, petalis alterna, in æstivatione spiraliter contorta; filamentis crassis, basi parce pilosis; antheris oblongis, prope basin dorso affixis, loculis lateralibus connectivum latum marginantibus, longitudinaliter dehiscentibus. *Ovarii* rudimentum nullum. *Fl. Fœm. Stamina* nulla. *Ovarium* sessile, liberum, uniloculare; *placentis* parietalibus, uniovulatis 3; *ovulis* suborthotropis, horizontalibus. *Styli* 3, divergentes. *Stigmata* dilatata, reniformia, crenata. *Bacca* spherica, 1-3-sperma. *Semina* testa ossea. *Embryo* orthotropus, in axi albuminis carnosoleosi; *radicula* brevi, cylindrica; *cotyledonibus* foliaceis, plicato-rugosis.—Arbor ingens Zeylanica; ramulis junioribus tomentosis; foliis alternis, petiolatis, oblongis, penniveniis, basi rotundatis, stipulatis; petiolis cylindricis; stipulis foliaceis, concavis, deciduis; florum paniculis racemiformibus, axillaribus, foliis brevioribus.

Trichadenia Zeylanica, Thw.—C.P. No. 2505 in Herbario Peradeniensi.

A very large forest-tree, not uncommon in the Central Province, at an elevation of about 3000 feet. The young branches are tomentose, and the growing apices are covered by the imbricated, rather large, concave stipules. The leaves are from 5 to 12 inches long, and from 2 to 4 inches wide, rounded at the base, coarsely dentate or sinuate upwards, and terminating in a narrow acumen; veins underneath tomentose, as are the cylindrical petioles, which are 2–3 inches long. Flowers 6 lin. wide, pale green. Fruit spherical, containing from 1 to 3 roundish or oblong seeds 9–11 lin. in diameter.

Closely allied to *Hydnocarpus*, from which genus however it differs in many important particulars, as a comparison of the generic characters will show. The Cinghalese call the tree *Tettigaha* or *Tettigass*, and extract an oil, which they use for burning, from the ripe seeds. The wood is of little or no value.

PLATE VII. Fig. 1. Flowering branch of female plant of *Trichadenia Zeylanica*, Thw., nat. size. 2. Flower, not expanded, showing the disrupted calyx. 3. Female flower. 4. Longitudinal section of ovary. 5. Transverse section of ditto. 6. An ovule. 7. Ripe fruit. 8. Ditto, with portion of pericarp removed, to show the seed. 9. Section of ripe seed, exhibiting the embryo :—all magnified. 10. Male flowers, nat. size. 11. Male flower, magnified.

Genus 2. HYDNOCARPUS, Gærtn.

Hydnocarpus octandrus, Thw.—C.P. No. 2640 in Herbario Peradeniensi.

Arbor mediocris, 40–50-pedalis, ramosa; *cortice* lævi; *ramulis* teretibus, junioribus strigoso-tomentosis; *foliis* alternis, integris, sub-obliquis, penniveniis, ovato-lanceolatis, utrinque angustatis, obtuse acuminatis, 3–4½ poll. longis, 1¼–1¾ poll. latis, supra glabris, subtus punctis glandulosis pilisque stellatis conspersis; *petiolis* ½–¾ poll. longis, supra sulcatis; *stipulis* minutis, strigosis, lanceolatis, deciduis; *inflorescentia* axillari, fasciculari; *fasciculis* 2–8-floris; *floribus* 5 lin. latis, externe pedicellisque pubescentia badia stellata vestitis; *pedicellis* 3 lin. longis; *sepalis* 5, oblongis, obtusis, concavis, inæqualibus; *petalis* 5, rotundatis, concavis, pilis sericeis albis ciliatis; *squamulis* 5, petalis oppositis iisque dimidio brevioribus, rotundatis, obtusis vel minute apiculatis, sericeis; *Fl. Masc. staminibus* 8, uniserialibus, ovarii rudimentum minutum cingentibus; *filamentis* subulatis; *antheris* adnatis,

oblongis, subquadratis, loculis lateralibus; FL. FÆM. *staminibus* 8; *antheris* sterilibus; *ovario* oblongo, strigoso; *placentis* parietalibus 4, singulis *ovula* 6 biseriata anatropa horizontalia gerentibus; *stylo* nullo; *stigmatibus* magno, disciformi, 4-partito; *bacca* sphaerica, subto mentosa, $1\frac{1}{2}$ – $2\frac{1}{2}$ poll. diam., pericarpio crasso, lignoso; *seminibus* 4–12 vel pluribus, oblongis, 10 lin. longis, 5 lin. latis, in pulpa molli immersis; *testa* subcrustacea; *embryone* in axi albuminis carnosì orthotropo; *cotyledonibus* foliaceis, cordatis, acutis; *radicula* crassa.

This species bears so great a resemblance to *Hydnocarpus inebrians*, Vahl (C.P. No. 1630 in Herb. Peradeniensi), that it does not appear desirable to constitute a new genus of it, notwithstanding its having a larger number of stamens than are found in the other known species of *Hydnocarpus*. The flowers of *Hydnocarpus octandrus* are, however, a good deal larger than those of *H. inebrians*, and the fruit too is considerably bigger, much paler in colour, and less tomentose. *H. octandrus* has as yet been met with only in one locality, in the Ambagamowa district, at an elevation of about 2500 feet. It is in flower in March.

A third species of *Hydnocarpus* (C.P. No. 2918 in Herb. Peradeniensi) occurs in the island, apparently closely allied to *H. alpinus* of Dr. Wight's 'Icones,' tab. 942; but I have not yet found it in a sufficiently good state of flowering to enable me to describe it satisfactorily.

Hydnocarpus inebrians of Dr. Wight's 'Illustrations of Indian Botany,' tab. 16, would appear, from the larger size of its flowers and fruit and the different shape of its leaves, as shown in the figure, to be distinct from the Ceylon *H. inebrians*; but not having seen authentic specimens of Dr. Wight's plant, I am unable to pronounce with certainty.

ON CHORTODES, a Subgenus of FLAGELLARIA, from the Isle of Pines (New Caledonia); by J. D. HOOKER, M.D., F.R.S. (TAB. VIII.)

The remarkable plant here brought to notice was collected by Mr. McGillivray and Mr. Milne, during Captain Denham's late visit to the islands of New Caledonia, in H.M.S. Herald, and is one of many interesting novelties that have rewarded the exertions of those indefatigable naturalists. In appearance and habit of growth it resembles a gigantic tropical Grass, and the foliage itself is of the same harsh tex-

ture as that of many *Bambuseæ* and *Paniceæ*. Though differing in various respects from the well-known *Flagellaria Indica*, I am induced to refer it to the same genus with that plant, in preference to establishing a new one; it may also (judging from the description) be allied to *Susum*, Blume, of Java, with which I am not acquainted. The dismemberment of genera of *Monocotyledones* has already been carried to an extreme in almost every Order; and in the present state of our knowledge of the species included under and allied to *Flagellaria*, it appears safer to enlarge its generic character, and to divide it into two subgenera, one for the present plant, and another to include *F. Indica* and its allies, than to add another genus which, upon a better acquaintance with its allies, may prove invalid.

In habit, foliage, and inflorescence, the present plant accords very closely with *Flagellaria*, especially in the long sheaths to the leaves, in the paniculate inflorescence, in the general appearance of the flowers and structure of the organs of fructification; it differs in not being scandent, in the strongly plicate leaves, which are much larger, and do not terminate in cirrhi, in the small petals, and usually three-seeded fruit. Of these characters the size of the petals is the only definite one that could be made available as generic, for there is a manifest tendency to plaiting in the young leaves of *Flagellaria Indica*, and the fruit of that plant being one-seeded, results from the imperfection of two cells of the ovary and their contained ovules. The sheaths of the leaves of *Flagellaria* are generally described as entire, but they are frequently split, especially the lower ones, and have often broad membranous margins, like those of *Chortodes*. I should therefore propose to modify the generic diagnosis of *Flagellaria* thus:—

FLAGELLARIA, L.—*Perianthium* persistens; laciniis 6, 2-seriatis. *Stamina* 6, hypogyna; filamentis filiformibus, liberis; antheris oblongis, medio dorso affixis, longitudinaliter dehiscentibus. *Ovarium* liberum, sessile, 3-loculare; ovulis in loculis solitariis basilaribus anatropis; stigmatibus 3, patulis, filiformibus. *Bacca* coriacea, pisi-formis, 1-3-loba, 1-3-locularis, stigmatibus coronata. *Semina* oblonga v. subglobosa; testa membranacea, tenui; hilo basilari, chalaza orbiculari; embryo lenticulari, minimo.—*Herbæ perennes*; caule erecto v. sarmentoso; foliis sparsis, longe vaginantibus; vaginis integris v. fissis, striatis plicatisve, interdum in cirrhos desinentibus; floribus bracteolatis, in ramis paniculæ amplæ decompositæ sessilibus, parvis, viridibus albisve.

I. Subgenus EUFLAGELLARIA.—*Perianthii* laciniae interiores exterioribus majores, submembranaceae. *Bacca* 1-locularis, 1-sperma.—Herbæ *sarmentosa v. scandentes*; foliis *striatis*, *apice in cirrhos desinentibus*, vaginis *plerumque integris*.

II. Subgenus CHORTODES.—*Perianthii* laciniae interiores exterioribus æquilongæ. *Bacca* 3-locularis, 3-sperma.—Herba *erecta*; foliis *plicatis*; vaginis *ad basin fissis*.

1. Flagellaria (Chortodes) *plicata*, Hook.; erecta, foliis late elongato-lanceolatis longe acuminatis creberrime plicatis et longitudinaliter nervosis nervis primariis minute scaberulis venulis transversis convexis, vagina fissa marginibus membranaceis superne in aurículas obtusas utrinque dilatata, paniculæ ramis puberulis, perianthii lacinii ovato-subulatis.

HAB. Isle of Pines, near the south extreme of New Caledonia; forming clumps by streams in the forest. *McGillivray* and *Milne*, October, 1853 (young fruit).

Herba elata, 5-pedalis, robusta. *Caulis* erectus, indivisus? *Folia* pedalia et ultra, 3-5 unc. lata, utrinque viridia, sicca coriaceo-chartacea, creberrime plicata, plicis 20-30, nervis primariis utrinque scaberulis, vagina spithamæa et ultra, subtilissime asperula, striata, ad basin fissa, marginibus late membranaceis, in aurículas obtusas stipulæformes utrinque producta, *ligula* brevissima membranacea. *Panicula* pedalis, ampla, ramosissima, ramis et ramulis gracilibus sæpe flexuosis angulatis puberulis. *Flores* parvi (1-2 lin. lati), sessiles, bracteola minuta suffulti; bracteola ramulo paniculæ adnata, dentiformi. *Perianthium* viride, basi late campanulatum. *Filamenta* filiformia, perianthio duplo longiora. *Antheræ* filamentis æquilongæ, lineari-oblongæ, dorso supra basin filamentis insertæ. *Ovarium* globosum; stigmatibus 3 filiformibus coronatum. *Bacca* immatura, $\frac{1}{10}$ unc. lata, 3-loba.

PLATE VIII. Fig. 1, flower advanced, with the stamens still attached; 2, immature berry; 3, tranverse section of berry; 4, immature seed:—all magnified.

Extracts of a Letter from Mr. WALLACE, dated "Singapore, October 10th, 1854."

On getting rid of my fever I went to a place in the interior called

"Ayer Panas" (hot spring), about fifteen miles from Malacca. Here there is a Government bungalow, which the late Resident, Captain Ferrer, had kindly offered me the use of. I was accompanied by a young gentleman of Malacca who wished for change of air and exercise, and whose acquaintance with the Malays and their language was of much use to me. We took provisions with us for a month, as nothing was to be had on the spot, and the only communication with Malacca was by special messenger.

The bungalow was pleasantly situated on a gentle elevation by one of the narrow, flat, winding paddy-field valleys, which are such a characteristic feature of the Malacca district. Along the borders of this valley were numbers of scattered Malay houses, all elevated five or six feet on posts, a mode of building which seems general in this part of the world, from the Peninsula to New Guinea. Two or three Malay police resided in the house, of which they had charge, and a Hindoo convict living in a little hut adjoining did the sweeping and cleaning. Numbers of fruit-trees grew near the house, the Durian and the Jack being the most abundant, with the ever-present Areca palm, and a noble gigantic species, the *Borassus Gomuti*, from the juice of which a coarse sugar called "jaggery" is made and sold in small cakes by the Malays. Sometimes grated cocoa-nut is boiled with it, and it then forms an agreeable sweetmeat, which, in the absence of any other delicacies, we used for our dessert.

We remained here nearly a month, exploring the jungle in every direction, and making extensive collections of birds, insects, etc. Here I first saw the huge bats commonly called "flying foxes," whose wings often expand five feet. They came in the evening to the fruit-trees near the house, looking more like aerial machines than any living creatures. It was truly an extraordinary sight to behold these great-winged animals for the first time, so totally different are they from anything we can behold in Europe. They are much esteemed for food by all the inhabitants of Malacca, and we soon had an opportunity of tasting one, but it was too tough for me to pronounce an unprejudiced opinion on its merits as an article of food. Several fine species of squirrels were abundant, and these were much better eating.

The Malays seemed to live a quiet, lazy life. A little patch of paddy field, cultivated almost entirely by the women and children, supplies them with food for the year by a few weeks of labour; and this, with

fruits and betel-nut, is all they want. They are of short stature, well made, but certainly not good-looking; and, taking the women and girls I have occasionally seen as a fair sample, there is very little necessity for their hiding themselves or covering their faces, unless indeed they are ashamed of them. Every Malay man or boy carries a creese, or knife of some kind, in a large wooden sheath by his side; this and the sarong they never go without. The "sarong" is a curious garment; it is a ring or cylinder of calico, about a yard deep and a yard and a half in diameter; it is worn in all sorts of ways; either over one shoulder as a scarf, or wrapped round the body like a Scotch plaid, or more generally put round the waist like a petticoat, and twisted or tucked in in a great bunch in front, having a curious and uncomfortable appearance, though, from its being generally of bright colours, it is not unpicturesque.

The people generally appear to be very good Mohamedans. They abstain rigidly from wine and pork; they pray pretty regularly, attend the mosques on Fridays, and have two or three wives when they can afford it. Many make the pilgrimage to Mecca; and they have school-masters in most villages, who teach the children to read the Koran and to write. Here was a degree of social organization which the successive European conquerors of the country had had nothing to do with; and one cannot help admiring the wonderful genius of that man whose doctrines and mode of worship should have spread so wide and taken such deep root, and who, however great the errors of his system, has at all events banished idolatry, and raised many barbarous nations one step in the scale of civilization.

We had now made up our minds to go to Mount Ophir, which lay about thirty miles further in the interior, and to reach the summit of which is a great object with all adventurous tourists who visit Malacca. We had heard most alarming accounts of the difficulties and fatigues we should have to undergo, and of the danger of being bled to death by the little leeches which infest the jungles. Of these, however, we had already had some experience, and had got used to them. They are about an inch in length, and slender, with suckers at both ends of the body, and move, not by crawling, like our common leeches, but by successive steps, exactly like the *geometric*, or measuring caterpillars. They do not inhabit the water, but frequent damp jungle, on the leaves of plants, where they may often be seen standing erect or outstretched on their posterior extremity, and moving about their head right and left

in search of something to attach themselves to. Their bite is so gentle that it is never felt, and when satisfied they drop off; so that the only intimation you have of their attacks is when, on changing your clothes, you find your stockings or trousers saturated with blood. This used to happen with us every day, the only inconvenience being a very great irritation as the bites healed. The leeches, therefore, we did not care about, and all other hardships we determined to put up with; but the difficulty remained to find men to go with us for a moderate payment, as we were determined not to be imposed upon, and the Malays are generally rather extravagant in their demands when a trip is contemplated to Mount Ophir.

At length, however, after several failures in our negotiations, we succeeded in agreeing with an old man and four young ones to carry our baggage to the mountain, and remain there a week with us and shoot birds, etc., during the time. Besides the necessary provisions, we took the smallest possible quantity of clothes and bedding, as we had to carry collecting apparatus, guns and ammunition, and "cadjaris" (or large mats, made of the leaves of a *Pandanus*) to thatch our hut with. It was a drizzling morning when we started, at about six o'clock, but this was quite as pleasant for walking. For the first three miles we had a pretty good wide road, through a lofty jungle, with only occasional mud-holes to wade through. We then reached a village where one of our men lived, and they proposed staying here an hour for one of the women to sift the rice, which they had found was so full of husk as to be almost uneatable. This being done, we again went on through a more open country, along paths among fruit-trees and cottages, and, crossing over a wide paddy-field valley, we reached another village about ten o'clock, where we stayed to breakfast. Starting hence about twelve, we crossed a second paddy-field, and then entered again into the gloomy jungle. Here our men loaded their guns with ball, assuring us that tigers, elephants, and rhinoceroses were all abundant. On our way they pointed out the footprints of these animals, and I was in hopes we should get a sight of them; but we went on mile after mile through the jungle and saw nothing till we again emerged at another village, where we were to get a guide who knew the road up the mountain. While resting here an examination for leeches took place, and many of our party found themselves bitten in several places. I escaped myself, by wearing my worsted socks over my trousers, and kept in their place by

boots laced up over them. I found several leeches in my boots, vainly endeavouring to find some aperture at which to enter. The little creatures are as tough as leather; nothing will kill them but cutting them in pieces. Our guide having been agreed with, we again went on over a very swampy country, crossing numerous paddy-fields and small streams, often up to our knees in mud or water. The path was here very bad, and at the end of a long day's walk we found it rather fatiguing. At length, between five and six o'clock, we reached the house of the "Paryooloo," or head man of the district, a little old white-headed Malay, who gave us the use of the verandah of his house with much civility.

The next morning early we were again on our way, and found the path very bad till we got into a long tract of jungle, where it became worse. It was now exceedingly narrow, and at every twenty yards there was either a tree fallen across the path to climb over, or a deep mud-hole to wade through, neither of which inconveniences could be avoided. Nevertheless we walked on briskly, and our men, though each carrying a load of about eighty pounds besides his gun, kept up with us in a manner that quite astonished me. Along this path we overtook or met great numbers of Chinese and Malays going to or returning from the gold mines of Mount Ophir, which are worked by Chinese. About ten A.M. we stayed at a brook in the middle of the jungle to breakfast, before which we enjoyed a bath in the cool water. Proceeding on, in about two hours we emerged from the jungle, and had a fine view of the mountain a short distance to our right. Here was an open space of high grass once cultivated, through which the path led to a stream which comes from the mountain. Our men now told us that a path must be cut through the jungle before we could proceed, and it would be better to remain here the rest of the day, while they explored and cleared a way for us. Though I am rather doubtful now whether this was necessary, we were obliged to submit to their guidance, and the two oldest men accordingly went off with their "parangs" (long Malay knives), while we roamed about to explore the locality till dinner-time. Close above us, on a bank, were some cocoa-nut and other fruit-trees, where a house had once stood, deserted, we were told, on account of the great number of elephants which infested the locality. All about we found paths trodden by these huge animals, and heaps of their dung in every direction, though all evidently some months old. The trunks of the cocoa-nut-trees were much rasped or gnawed at two

or three different heights from three to six or seven feet. The lowest of these marks were made by deer, who eat the fibrous wood of the palm, and the higher ones, our men said, by the elephants. Our hopes were thus again excited; but our head man told us that this year the elephants had deserted the place; though only a year ago, when he slept at this very spot, he heard their loud trumpeting all around him. We were therefore condemned to a quiet night, which we passed sleeping on the ground, with our palm mats supported by poles forming a roof over us.

The following morning we started to ascend the mountain, and proceeded for about an hour through a flat swampy jungle and occasional open grassy fields, till we reached a spot higher up the river we had left. Here our guide told us was the last place we should find water till we reached the top of the mountain. We therefore stayed here to breakfast, and had a small shed made in which to leave most of our baggage, taking with us only what was absolutely necessary. The little river here rushed among large granite rocks, and on its banks were many beautiful ferns. From this spot we began to ascend, and for about an hour continued climbing up a moderately steep hill. We then rested awhile, and were somewhat disgusted when our guide told us we were not half-way up the first hill. The most conspicuous objects in this jungle were the stemless *Pandani*, with leaves twenty feet long, like immense pine-apples. The prickly climbing palms of the genus *Calamus* were also abundant, and often of immense size, and fiercely armed with thick-set spines. In the more swampy parts of the jungle through which we passed before breakfast we had been much struck by some gorgeous flowers which everywhere grew on the surface of the ground without stem or leaves; they were of the most intense crimson and yellow, and in the gloom were quite dazzling. They belonged however to a scitamineous plant which covered the low parts of the jungle, and whose leaves grow from the ground on long straight stalks eight to ten feet long. As we continued our ascent I found, by looking right and left, that the ground fell more or less abruptly on each side of us, and that we were in fact going along a ridge or spur of the mountain. At length, after a very fatiguing pull, we came to a little level ground, and then commenced a deep descent. We still kept however to the ridge, for all the way the ground fell on both sides of us, and the same was the case in the hollow or saddle at the bottom, and in the next

ascent. This was more precipitous and difficult; the vegetation became more dense and stunted, and the curious pitcher-plants began to appear. To the first summit we had ascended near 2000 feet, we then descended about 500, and we had now a fatiguing ascent of about 1200 feet to reach "Padary Batter," which was to be our resting-place. When at length we reached it I was well repaid by seeing, for the first time, something of tropical mountain vegetation. My experience had hitherto been entirely in the plains.

"Padary Batter" (the rocky field) is an expanse of even granite rock, at an angle of about 25° , and at an elevation above the sea of about 2700 feet. It is in places quite bare, in others covered with a dense mass of sedgy vegetation, a great portion of which is composed of the grass-leaved *Arundinacea*, a beautiful Orchideous plant with purple flowers. But the most singular feature is the *Coniferæ*, which at this comparatively slight elevation suddenly appear in great abundance. There are here three species of *Dacrydium*, straggling irregular trees of twenty or thirty feet in height, with the leaves of a fir and the loose bark of a yew-tree. Next to these the Pitcher-plants were the most striking. They were in great abundance, and there appeared to be a great many different kinds, though, without a careful study of them, it is difficult to determine how many may be different states of the same plant. Some have magnificent purple spotted pitchers eight inches long, and of a very thick and solid texture; these are borne in the air on the end of the long twisted midrib of a large leaf. Others are almost orbicular, and grow in a cluster on the ground, the leaf being reduced to such a rudimentary state as to be merely a stalk to the pitcher. Other kinds vary from both of these; but we were more occupied in our search after their liquid contents than in the examination of their botanical peculiarities, for the thermometer stood at 85° , and since we left the bottom we had seen no water. Now however we had plenty, and by selecting those pitchers which were unopened, or were buried in moss and foliage, we obtained very drinkable water. Most of them contain a kind of insect soup, too strongly flavoured with formic acid, as I discovered, to my disgust, in my first eager attempts to get a drink. I here took an observation for the altitude with the sympiesometer, and we then proceeded with the ascent. We soon again entered a scrubby jungle, where we found the fine Mount Ophir Ferns in great abundance. One of these, the *Matonia pectinata* of Brown, is most beautiful; the frond grows on

a slender stalk six to eight feet long, and is most elegantly shaped, forming a drooping crown of foliage. Here also grew a beautiful *Cypripedium*, probably *C. barbatum*, and a little higher up a handsome *Dendrobium*.

After ascending about 800 feet higher we found ourselves on a peak called "Gunong tundok" (the hanging mountain), and close opposite to us was Mount Ophir itself, with lower peaks on each side of it. The prospect of another descent, and an apparently almost vertical precipice between us and the summit, was now too much for our coolies, and three of them declared they could go no further; we accordingly left our guns and most of our bedding; and with the old man and our guide (and each of us carrying a bundle), we went on, leaving a portion of rice for those that remained. There were plenty of pitcher-plants about, so they did not want for water. The descent and succeeding ascent were very precipitous. Often we had to climb up by roots and creepers, but the distance was comparatively small, and we soon reached our resting-place, a huge overhanging rock, which forms the summit of the mountain. It is about 150 feet high, and under it is a little hollow full of water, which trickles imperceptibly. A winding craggy path leads to the summit, which is tolerably flat, but not more than thirty or forty yards in diameter, and covered with *Daerydiums*, and with a shrubby vegetation of *Elæocarpus*, *Vaccinium*, *Rhododendron*, *Eugenia*, etc.; few however were in flower. We had occasional glimpses of a magnificent view, but masses of cloud continually rolling below us prevented any satisfactory panorama.

Returning to our rock we found the rice cooked, and after dinner I took an observation for the altitude, and then searched for shells and insects till dusk, with however but little success. The rest of our party had thought better of it, and had come after us; the evening was still and cloudy, and, lying on a bed of bushes and ferns, with a blanket over us, we were quite warm. During the night the thermometer did not fall below 66°.

In the morning we again went to the summit, and searched diligently for insects, etc. We were rewarded by finding a few rare *Coleoptera* and *Hemiptera*; and as the sun came out, some fine butterflies, of the genus *Pieris*, handsomely marked with red and yellow, began to appear flying round and round about the summit. I succeeded in obtaining two or three fine specimens. Of birds we saw only some swallows

sailing over the surface of the shrubs, capturing the small flies and other insects, and a small honeysucker, which we could not approach near enough to determine accurately. Some of our men found a few small shells, two *Helices*, and a pretty little *Cyclostoma*. Occasionally we got a fine view in one direction, but the rolling masses of cloud prevented any complete panorama. I could see however sufficient to confirm me in the opinion that in this part of the peninsula there is no connected mountain-range, but isolated hills and groups of hills rising out of a great forest plain. The Moa river was a beautiful object, but the paddy-field valleys before mentioned looked more imposing, appearing in the distance like large rivers.

About ten o'clock we descended, on our way down collecting a few of the beautiful Ferns and some of the flowering plants. We had sent half of our men off early in the morning to prepare a hut for us at the foot of the mountain, where we intended to remain a week. We found the descent apparently longer and more tiring than the ascent. The day became overcast, a drizzling rain fell, and we saw neither birds nor insects to enliven the path. We reached the bottom about three P.M., and found our hut erected in a little spot which the men had cleared close by the river. We were glad to rest for the remainder of the day.

We stayed here a week, our men shooting, and we ourselves roaming about the jungle and up and down the river collecting. Insects were tolerably abundant, and I obtained numbers of new and remarkable species. Little dragon-flies of the most exquisite hues were to be found along the brook side, while on the surface of the water were "water boatmen" and "water scorpions," and a very handsome whirly-wig beetle, the *Porrhynchus marginatus*, Castl., allied to our little *Gyrinus natator*, but three times as large, of a yellowish colour, long snouted, and spined behind.

Among the curious things to be observed here was the singular colour of some of the leaves in the jungle. Some Ferns and Lycopodiums and some other plants growing near the ground were of a shining metallic blue colour, as if tinged by some gaseous exhalation. The same plant in other places I have observed of an ordinary green, so that it is due to something in the soil or atmosphere of the locality. We were not fortunate enough to see any large animals. Wild cattle abound here, but we saw only their footsteps; our men however declared one day they had seen a rhinoceros. We heard the fine Argus pheasants

every evening, but they were so wild that it was impossible to get a sight of them. Our rice being finished, and our boxes crammed full of specimens, we returned, our men taking us by what they termed a better road, winding about through Malay villages, and making our second day's walk upwards of thirty miles. I only stayed at Ayer Panas a sufficient time to pack up all my collections, and then returned to Malacca on my way to Singapore. We were congratulated by all our friends on having lived a week at the foot of Mount Ophir without getting fever.—A. R. W.

Botanical Objects communicated to the KEW MUSEUM, from the AMAZON or its Tributaries, in 1853; by RICHARD SPRUCE, Esq.

(Continued from vol. v. p. 247.)

122–143 are instruments used or ornaments worn by the Uaupé Indians, and principally by their chiefs, or *Tucháuas*, during their festivals (called *Dabocurís*). There are duplicates of nearly all.

The Rio Uaupés joins the Rio Negro a little north of São Gabriel, and its course is nearly coincident with the actual Equator.

122. *Murucú*, or staff, used by the *Tucháuas* (chiefs) of the Uaupé Indians. The wood is of the *Mura-piranga* (i. e. red wood),—1915 to Bentham,—a handsome large-flowered Myrtaceous tree, growing on the inundated shores of the Rio Negro. Near the base is a hole, containing pebbles, which rattle with every motion of the *Murucú*; they have been inserted by heating the wood, and distending the orifice so as to admit their entrance. Of the ornaments on the upper part, the lowest is of narrow strips of the skin (with the hair) of a small black monkey called *Uaïapissá*, frequent near São Gabriel, and excellent eating. Then follow a few feathers of Toucan, and white down from the breast of the *Mutún* (Curassow). The bright blue feathers are of some small bird; they are tightly wrapped with Curauá string. The two terminal processes (stuck into clefts and wrapped with curauá, stained with carajurú) are generally two pieces of bone, and are sometimes smeared with Uirarí, so as to cause the death of any person they pierce; but as the instrument is not used in war, I cannot say why it possesses this deadly apparatus.

123. *Acanga-tára* (i. e. head-band or tiara). (This kind is worn

only by the Tucháuas.) The cloth forming the base is of Curauá. White down of *Gavião real* (*Aquila regalis*?), or of *Mutún* (*Calax alector*). Feathers of *Aráru* (Macaw); the yellow ones, from the tail and shoulders of the bird, having been changed from their normal scarlet colour by some artificial treatment in the domesticated state. String of Curauá, smeared with the gum of the *Ananí* (*Moronobea globulifera*), and then rolled in the hairs of the monkey called *Macaco barrigudo*: to make a thick cord, several strands of this are twisted together.

Note. The hairy cord on most of the other ornaments has all been made in this way.

124. *Acanga-tára* (of attendants). The framework of one of these is of *Uarumú* (the name given to various species of *Maranta*), of the other of *Tucúm* (*Astrocaryum vulgare*); the concentric rings being strips of the petiole, and the interwoven fillet-slips of the leaflets. The feathers are of Toucans.

125. *Acanga-tára* (of attendants). Changed feathers of *Arára* fixed on a cord of monkey's hair.

126. *Acanga-tára* (of attendants). These are merely feathers of Toucan fixed on slender Curauá string.

127. Necklace of the teeth of the *Jaguára-té*, or *Onça* (*Felis onça*, L.). The teeth are bored near their base, and a slender string of Curauá passed through the hole attaches them to a stout cord of monkey's hair.

128. Neck-ornaments of chief (Tucháua). These are pieces of porphyry (which occurs in veins in the granite throughout this region) cut into a cylindrical form, slightly bulging in the middle and with convex ends. The hole near one end; by which they are suspended, is bored by means of slender strips of the skin of the stem of a species of *Alpinia* (called *Pacóva-sororóca*), twirled rapidly between the palms of the hands, with the addition of a little fine sand. It is said to be the work of weeks to bore one of them. The string is of *Tucúm*, and the seeds are said to be those of some sort of Gourd. Stones hung perpendicularly, as these are, are worn only by the Tucháuas; those of the rest of the tribe being suspended horizontally, and very much smaller in size.

(To be continued.)

On URANDRA, a New Genus of Olacaceæ, and some other Ceylon Plants belonging to that Natural Order; by G. H. K. THWAITES, Esq., Superintendent of the Royal Botanic Gardens, Peradenia, Ceylon.

Nov. Gen. URANDRA, Thw. Tribus ICACINÆ.

Gen. Char. Flores hemaphroditi. Calyx cupuliformis, 5-dentatus, persistens. Corollæ petala 5, calycis segmentis obtusis alterna, oblonga, acuminata, valvata, lævia. Stamina 5, petalis alterna, exserta; filamentis crassiusculis, versus apicem densissime pilis longis clavatis vestitum, latioribus; antheris adnatis, introrsis, longitudinaliter dehiscentibus, loculis basi paullo divergentibus. Ovarium conicum, basi annulo glandulari parvo cinctum, uniloculare, biovulatum. Ovula ex apice loculi pendula. Stylus subnullus. Stigma minutum, subcapitatum. Drupa oblongo-attenuata, monosperma; pericarpio subcarnoso, intus ligneo-fibroso. Embryo in axi albuminis carnosius; radícula elongata, cylindrica; cotyledonibus planis, foliaceis, cordato-acuminatis, in albuminis medio sitis et eodem multo minoribus.—Arbor Zeylanica ingens; ramulis teretibus; foliis alternis, penniveniis, petiolatis, integris, lanceolatis, coriaceis, exstipulatis; capitulis 7-12-floris, bracteatis, pedunculatis, axillaribus.

Urandra apicalis, Thw.—C. P. No. 2569 in Herbario Peradeniensi.

A very large tree, rather common in some forests of the Central Province, at an elevation of from 1000 to 2000 feet. The leaves are coriaceous, perfectly smooth, bright green above, paler beneath, 4-6 inches long by 2-3 inches wide, ovate-lanceolate, rather suddenly acuminate and narrowed towards the petiole, which is grooved above and from $\frac{1}{2}$ to $\frac{3}{4}$ inch in length. Petals purple, with the apical half greenish. Drupe oblong, pointed, $1\frac{3}{4}$ inch long and 10 lines wide, green, more or less tinged and blotched with purple, the upper half white.

The Kandians call the tree *Oorookannoo-gass*.

This species is closely allied to *Stemonurus*, Bl. (*Gomphandra*, Wall.), but differs in all its flowers being fertile, in its small, not pulvinate stigma, and in the structure of its ripe fruit. The habit of the plant is also distinct, and the flowers and fruit are much larger than in the species of *Stemonurus* occurring in the island. As regards the latter genus, I may remark that I am acquainted with but two species belonging to it as natives of Ceylon, C. P. Nos. 251 and 375 in this herbarium, which are very abundant; and as these vary very much in

the size and shape of their leaves, I suspect they furnish the materials of the four described by Mr. Miers in the 'Annals of Natural History,' ser. 2, vol. x., as growing in Ceylon. I have carefully examined ripe seeds of what I take to be the *Gomphandra polymorpha*, W. et Arn., and have not been able to discover the large thin cotyledons which Mr. Miers* states he found present in the single specimen he dissected. According to my analysis, the albumen is divided longitudinally into two subequal portions by the intervention of a loose cellular stratum, whose margin nearly reaches on every side to the testa, or rather to a whitish raised line, which is very conspicuous on the outside of the seed, passing quite round it lengthwise, and consisting of a fillet of spiral vessels lying between the two thin coats or layers of the testa. The loose cellular stratum is organically connected with the albumen; its cells being a continuation of those of the albumen, and differing from them principally in containing no amylaceous granules. The cells of the albumen are arranged in lines radiating from the central loose tissue to the periphery of the seed. The orthotropous roundish embryo, which is very minute, lies close underneath the hilum, within a somewhat dilated portion of the loose cellular tissue above described; the cotyledons are exceedingly small. Before maturity the embryo is attached by a suspensor to the foramen.

The same eminent botanist (Mr. Miers) describes, in the work above quoted, vol. ix. p. 396, three species of *Mappia*, Jacq. (*Stemonurus*, R. W.), as indigenous to Ceylon. I have collected specimens from a variety of localities at different elevations and can discover no satisfactory specific distinction between them, but merely such differences as may be considered due to climatal influence. The specimens from the hills are more robust, with thicker leaves and larger flowers, whilst those from the low country have thin flaccid leaves, varying greatly in size, and small flowers, narrow when in bud. Intermediate forms however occur, showing the above to be merely varieties of one species. A similar variation, resulting from difference of climate, exhibits itself in *Turpinia*, *Eurya*, *Bhesa* (*Kurrimia*, Arn.), *Elæodendron* and other genera, constituting probably sub-permanent varieties; but it surely is not expedient to exalt such varieties into species.

* Annals of Natural History, ser. 2, vol. x. p. 31.

BOTANICAL INFORMATION.

Note on PIASSABA.*To the Editor of the Kew Garden Miscellany.*

Dear Sir,—You must well remember the surprise which was caused among botanists by the very confident manner in which Mr. A. R. Wallace announced, in his little work on the ‘Palm Trees of the Amazon,’ that the plant producing the Piassaba of commerce is not the *Attalea funifera* of Martius, but a *new species* of *Leopoldinia*, which he called *L. Piassaba*.* Mr. Wallace honestly confessed himself but slightly acquainted with the science of botany, which excited still more surprise that he should, in his first essay, ‘unhesitatingly’ offer an opinion in opposition to the immortal Martius, whose work he has so largely used in his ‘Palm Trees of the Amazon;’ while many attributed it rather to his want of a fuller knowledge of the subject.

In your review of his book you took a wiser view of the case: acknowledging your respect for the opinion of the great German botanist, you nevertheless thought it advisable to inquire more fully into the subject.

* In justice however to Mr. Wallace, and in justice to the author of the critique in our ‘Journal of Botany,’ we insert the following extract of a letter just received from Mr. Spruce:—“When Mr. Wallace came down the Rio Negro, in September, 1851, he showed me a few figures of Palms. I pointed out to him which seemed to be new, and encouraged him to go on. I also proposed that we should work them up together, I taking the literary part and he the pictorial, which he declined. As I had also met with some of his Palms, and had my names for them, this caused me to relax in my study of the tribe, seeing myself likely to be forestalled in the results of my labours. He has sent me a copy; the figures are very pretty, and with some of them he has been very successful: I may instance the figures of *Raphia taedigera*, and *Aerocoma sclerocarpa*. The worst figure in the book is that of *Iriartea ventricosa*. The most striking fault of nearly all the figures of the larger species is that the stem is much too thick compared with the length of the fronds, and that the latter bear only half as many pinnæ as they ought to have. The descriptions are worse than nothing,—in many cases not a single circumstance that a botanist would care to know; but the accounts of the uses are good. His *Leopoldinia Piassaba* and *Mauritia Carana* are two magnificent new Palms, both correctly referred to their genus, but the former has been figured from a stunted specimen. I have got a series of specimens for your Museum, showing the way in which the *Piassaba* grows on the tree.”—It is thus clear that there are two Palms affording the Piassaba of commerce, of which the one we have as good reason to believe to be the *Attalea funifera* of Martius, as we know the other to be the *Leopoldinia Piassaba* of Mr. Wallace; and our friend Mr. Archer, in his present letter, thanks to the commercial importance of his place of residence, confirms the fact by the statement of a difference in the fibres of the two.—Ed.

I am strongly inclined to think that the result will prove you right ; for I believe it will be found that the production of this curious and now very useful vegetable fibre is not confined to one plant, but is certainly yielded by two Palms at least. At all events I am prepared to prove that there are two distinct kinds of Piassaba known in commerce, differing so widely in quality that one now sells for £20 to £30 per ton, whilst the other realizes not less than £45. I hope soon to send specimens of both to the Museum of Economic Botany.

It is still stronger evidence in favour of my opinion, that these two qualities do not come from one locality, but the very fine kind comes from (the Rio Negro by way of) Pará, and the inferior one from Ceará. There is too little difference in these two places to warrant the supposition that a mere change of habitat can be the cause ; and as the trees are not *cultivated* in either district, it cannot result from culture ; the cause therefore will in all probability be as I have suggested.

At present the consumption of Piassaba is very considerable. I cannot exactly ascertain the quantity imported, but it is certainly over 2000 tons ; the coarser kind (Ceará) is used for street brooms and similar rough cleaning implements, but the fine kind (Pará) is extensively employed in the formation of brushes used in the cloth factories, and when dyed black is largely mixed with bristles and used in the manufacture of cheap clothes-brushes, and even hair-brushes, etc.

Whether Mr. Wallace has truly described the Palm from which he saw the Piassaba taken, is another question, and can only be decided by a competent botanical authority, after an examination of the plant ; but his powers of observation are considerable, and have been well trained, and his opinion is entitled to that respect which you so gracefully accorded. Yours truly,

T. C. ARCHER.

June 11, 1855.

Sarsaparilla. Extract of a Letter from MR. SPRUCE, dated Rio Negro, February 5, 1855.

Sarsaparilla is growing scarce and difficult to obtain on these rivers, and is now found only at the head-waters of some of the tributaries of the Rio Negro, Orinoco, and Casiquiare. Lower down the same streams it seems to have been all uprooted. Those who go to gather it must spend four or six months in the forest, and endure all sorts of priva-

tions. I have never in the whole course of my wanderings come across one of the species of *Smilax* which affords Sarsaparilla of commerce, though I have gathered numerous species of that genus. But in 1852 I saw plants of a *Smilax* near São Gabriel (and I sent specimens of the leaves and fruit to Kew), which had been brought from the Canaburís, and from which I saw the roots extracted and dried for sale.

Those who go to collect Sarsaparilla tell me they are guided by three characters :—

1. Many stems from a root.
2. Prickles of stem closely set.
3. Leaves thin (not coriaceous).

I am assured that the species of *Smilax* possessing these characters united have also numerous long roots, radiating horizontally from the crown ; while the single-stemmed species have only a solitary tap-root.

I am aware that the Jamaica Sarsaparilla is said to command a better price in the market than that of Pará, but I thought it had been planted in that island. Of the Sarsaparilla collected in the upper tributaries of the Orinoco, of the Rio Negro, the greater portion goes to the Pará market, where it fetches a better price than at Angostura. I am not aware that it enters into the commerce of any other port in Venezuela except Angostura ; and it is curious if the same Sarsaparilla coming to England by way of Jamaica sells for double the price that it fetches when sent by way of Pará. Just now there is no demand whatever for Sarsaparilla in the Pará market, and, like every other drawback to commerce, it is attributed to the war with Russia ; with what reason, you will know better than I.

NOTICES OF BOOKS.

CARL MÜLLER : *Recensio Generis Graminearum ZOYSIA*, in *Mohl and Schlechtendal's 'Botanische Zeitung,'* 1855, No. 16.

A Nuremberg horticulturist, improving upon Pansner's Gooseberries, has published a monograph of Apples, which he divides into 15 genera and 1263 species, each with its formal Latin generic and specific name and so-called diagnosis. Although nothing can be so absurd as this exaggerated attempt to classify the unclassifiable, to express in precise

words inappreciable differences in colour, smell, flavour, etc., yet in horticulture the methodical distinction of varieties, however vague and uncertain, is often of considerable importance. But we are daily more and more threatened with invasions into the field of botany of similar principles. Species which, owing to their wide geographical range and facility of accommodating themselves to a number of different climates, seasons, soils, and aspects, show great diversity in their outward appearance, have been considered as genera; and any appreciable differences, not only in different individuals but in fragmentary specimens, have been regarded as distinguishing species. Instances could be named where two or three genera and twenty or thirty species have been carved out of a single Linnæan species, which an unprejudiced review of numerous specimens from a great variety of localities compels us to return to. This is more especially the case with the weeds of cultivation, with maritime, aquatic, and amphibious plants, and with those genera and natural orders where the type of the floral organs is much reduced, such as *Pistia*, *Callitriche*, *Chara*, Ferns, and Glumaceous plants.

The *Gramineæ* have been peculiarly unfortunate as to their specific demarcation. With a great general similarity of habit, this extensive family presents a wonderful variety in the modifications of the floral parts. This circumstance, together with the great reduction these organs have undergone from the more regular types of the higher Monocotyledonous Orders, has directed to *Gramineæ* the special attention of many of the greatest botanists, as well as of a host of minor dabbles in the science. Speculations without number have been put forth on their typical structure, a large proportion of species have been analysed and described with the greatest minuteness, and a still larger mass of forms have been published with loose and incomplete diagnoses; but we have as yet had no experienced botanist, with true philosophical views, who has taken the trouble to go through the chaotic mass and reduce it to manageable order. Trinius and Nees von Esenbeck have done the most towards it; but Trinius's materials were insufficient, and he did not live to complete his work. Nees von Esenbeck's labours show the greatest knowledge of the subject, and if we do not always agree with him in the number of species he admits, still the forms he describes are at the least appreciable varieties, and his observations are accurate; but he also has given up the science without having completed any general work on the Order. Kunth had studied the family well, and described

a large number of species (or shall we say specimens?) with minute accuracy; but when he came to publish a general enumeration, the urgency of booksellers forced him to draw it up in the greatest haste, and he produced a mere compilation, where his own descriptions are followed by or intermingled with the diagnoses of others, without method or criticism, so that the determination of Grasses by his book is perfectly hopeless. A new enumeration, Steudel's 'Synopsis Glumacearum,' has now appeared, with great pretensions at method, uniformity of diagnoses, and subdivision of the large genera. As a compiler the author deserves great credit, and produces most useful works of reference—indexes, as it were, to the productions of others, but as a work of science his *Gramineæ* have already met with much deserved criticism. His materials must have been totally inadequate to the task; he can have seen but very few authentic specimens of described exotic species, for the number of those he repeats as new genera is very considerable; his generic, sectional, and specific characters are ill-defined, and not contrasted; and the multiplication of species without critical comparison is enormous. There are few who have carried out on so large a scale the principle, that plants described by different authors under different names, or coming from different countries, *must* be distinct, however inappreciable the supposed characters.

Among his critics there is one however who has the boldness to find fault with him in the opposite direction. Accustomed to the most minute microscopical variations used for the distinction of Mosses, Dr. Carl Müller proposes to introduce into the specific demarcation of *Gramineæ* two elements, against which we must enter our solemn protest:—the application of the microscope to differences in the surface and circumscription of the herbaceous organs, and what he calls the *phylogeographical* principle. As an exemplification he has taken the genus *Zoysia*, which will also afford an apt illustration of our own views.

The *Zoysia pungens*, Willd., is a common sea-coast plant in tropical and subtropical Asia, extending from the Mauritius and Ceylon, along the shores of India, and thence through the Moluccas to Australia and New Zealand, and northward apparently (though perhaps less continuously) to China and Japan. Like the European Grasses which in a similar manner grow half buried in maritime sands, it varies much in size and stature, in the length of the spike, in the number and density of the spikelets, in the creeping or tufted stems, in the colour,

and, to a certain degree, in the shape of the spikelets. Besides that, in dried specimens there are numerous variations, which depend upon the season, the age of the plant, the state of the atmosphere, etc., when the specimen was gathered, or the way it was dried, all which disappear in the living plant; such are the flat or convolute leaves, the number and straightness or crispness of the hairs at the mouth of the vagina, the prominence of the tubercles from which they arise, the size and degree of laceration of the ligula, the breadth and colour of the spikelets, the texture of the glumes and valves and the degree of prominence of their nerves, etc., all of which it is now sought to introduce into specific diagnoses. The minute denticulations of the apex of the glumes and paleæ and the length of the minute point or arista of the upper glume are variable in this, as in so many other Grasses, in one and the same spike. Of the specific unity of all these supposed varieties we have the testimony of all the great agrostologists who have had good materials to examine, of all Indian botanists who have seen the plant in its native stations, and above all of Robert Brown, whose decisions are those of an acute and powerful mind, founded in most instances upon the accurate observation of living plants, confirmed by a careful analysis of numerous and well selected dried specimens. Our own opinion is derived chiefly from the examination of the Hookerian and other herbaria at Kew; which contain between forty and fifty specimens of *Zoysia pungens*, collected at fourteen or fifteen different localities within the limits above assigned to it.

From Dr. Carl Müller's paper it would appear (though not expressly so stated) that he possesses five specimens only, which he considers as so many distinct species. One, from Griffith's Malacca* collection, he considers as the true *Z. pungens*, and so far he is right, as is shown by the corresponding specimens which we possess. He has then two Australian specimens, both given by Robert Brown as the true *Z. pungens*, but which Dr. Carl Müller distinguishes as species, under the name of *Z. sedoides* and *Z. Brownii*; but here, for the reasons above stated, Mr. Brown's authority will surely prevail, and our own Australian specimens certainly belong to the true *Z. pungens*. The fourth is a supposed inland plant, being distributed with the label "Serampore, Griffith," and upon the phytogeographical principle, as well

* In p. 267 of the above-mentioned paper it is called "das Gras von Serampore," but this is a slip of the pen, as plainly appears from the rest of the paper.

as upon supposed minute characters, this is described as a very distinct species, under the name of *Z. Griffithiana*. The geographical principle disappears entirely when we know that all the plants labelled as above were from Dr. Voigt's collection made in the Botanic Garden of Serampore, and consisted of the plants cultivated there, with a few of the garden weeds. We have several specimens of this *Zoysia* from the same source and with the same label. It is the common sea-coast plant, starved apparently in the Serampore garden for want of its genial maritime air. Some of our fragments correspond to C. Müller's description, but they are accompanied by a larger specimen (most probably from the same tuft), in which almost all his characters disappear.

We have not seen Dr. Müller's fifth specimen, gathered in Java by Zollinger, which he calls *Z. aristata*, but both the locality and the characters are within the ordinary range of *Z. pungens*.

If we had never seen our *Poa annua* growing, and if we were working in some remote corner of the globe (if such there be) where it does not grow, only possessing in our herbaria a half burnt-up hard fragment from the hot Mediterranean coast, a luxuriant specimen of the brightest green, with broad leaves, from some of the rich pastures of central Europe, a purplish-tinted Tom-Thumb specimen from one of our dry downs, a stunted compact one from the cold subarctic regions, and a strong one from the United States or some distant part of Siberia, could not we readily find microscopical and phytogeographical characters to distinguish them as so many species?

THE PHYTOLOGIST: a Botanical Journal. *New Series.* Nos. 1 and 2, May, June, 1855. London. W. Pamplin. 8vo.

We are glad to see this new series of 'The Phytologist' with the respectable name of "W. Pamplin" as the publisher. This is a sufficient guarantee for the character and respectability of the journal, even if there were no such pledge given in the Introductory Address of the editors as the following:—"We are unbiassed by the views of particular schools, scientific coteries, and the like, and hence we call no man our master. Again, as truth is our object, we will not be influenced by authority, however eminent, to swerve from verity. On the other hand, we will sedulously avoid giving any cause of offence to *collaborateurs* in the great cause of science. Our aim will be to disseminate

scientific information, to publish facts, or legitimate inferences from facts, and to avoid all needless disputes, personal squabbles, sectarian peculiarities, and the like." The work is intended to be devoted to the investigation of British plants, and, like the former series, to be the medium of supplying the botanist with a record of the progress of British botany. "As an essential and attractive feature of the new series of the 'Phytologist,' arrangements have been made for supplying with every number one sheet, or half a sheet at least, of descriptive *British Botany*, with distinct, independent pagination, which, when completed, will form a portable Flora."

The articles in the two numbers before us are—1. An Account of the Localities of some of the rarer British Plants and others noticed in North Wales by Mr. Pamplin and Mr. Irvine, in September, 1854. 2. On Popular Names of Plants; where that of "*Waybred*" (*Plantago major*) is discussed. 3. On the Statistics of the Order *Ranunculaceæ* (British species). 4. Botanical Notes from South Devon, by T. W. Gissing. 5. On the Wimbleton Station of *Anemone apennina*. 6. A Catalogue of certain Plants growing Wild, chiefly in the environs of Settle, in Yorkshire, observed by W. Curtis in 1782. 7. Reviews. 8. Notices of the Linnæan Society. 9. Botanical Notes, Notices, and Queries. 10. Notes to Correspondents. 11. Books received for Review. The 'British Botany' occupies eight pages in each number, and seems to be carefully and satisfactorily done. We know not why, but the names of the editors of the work are sedulously suppressed, which we regret, for we see no reason for such concealment, and it is attended with this inconvenience, viz. that in the case of a new plant being described, or a supposed new one, "*R. confusus*, Nob." for example, at page 8 (of the *Aquatis* or *Batrachium* group), it would be impossible, in any future work on British plants, to give the true authors the credit, or otherwise, of such a species. The work is printed on excellent paper with good type by J. E. Taylor, and the neat cover bears no less than three mottoes or inscriptions, in as many languages, not in *Hebrew*, Greek, and Latin, but in (we presume) *Welsh*, and Greek, and Latin; the first is so enigmatical and unintelligible to us, that we shall be thankful if the editors will devote half a page in explaining it in some future number. A woodcut, of probably a *Dianthus*, is encircled by a sentence, of which the words are so placed that the uninitiated, as in a round-robin, cannot tell which is first and which

last; and they are alternately reversed, "Dduw uṇḍḍ Heb qeH." In various particulars this work is so unlike its predecessor of the same name, that we should have considered it a distinct publication, but for its bearing, besides "No. 1, New Series," the number "CLIX."—we presume, of the old series. Now the last number of the 'Phytologist' that we received is indeed No. CLVIII.; but our copy at least is an imperfect or incomplete volume, of only 216 pages (the previous volume reaches 1160 pages), and has neither title nor index. In its altered form we cannot doubt but it will meet with the support and encouragement that it deserves from British botanists.

LOUDON'S ENCYCLOPÆDIA OF PLANTS; *comprising the specific Character, Description, Culture, History, Application in the Arts, and every other desirable particular respecting all the Plants indigenous to, cultivated in, or introduced into Britain. New Edition, corrected to the present time. Edited by Mrs. LOUDON; assisted by GEORGE DON, F.L.S., and DAVID WOOSTER, late Curator of the Ipswich Museum.* One very thick 8vo volume of 1574 pages. Longman and Co. 1855.

This is one of the most remarkable works perhaps that has ever appeared on the subject of Botany in our country, of which the first edition is familiar to very many people both at home and abroad, a very large impression indeed having been prepared in 1829, and for many years the work has been out of print. Indeed, it required the patience, the research, and the genius of Mr. Loudon to perform the task, and he had fortunately the assistance of Dr. Lindley and of the late Mr. David Don in the descriptive matter, and of Mr. J. D. Sowerby in the execution of the truly beautiful woodcuts. The object, as was then stated, was "to include in this Encyclopædia all the indigenous, cultivated, and exotic plants which are now found in, or have been introduced into, Britain; to give a natural history of those plants in popular but not unscientific language, accompanied by such descriptions, engraved figures, and elementary details, as should enable a beginner, who is a mere English reader, to discover the name of any plant which he may find in flower, refer it to its proper place, both in the Natural and Artificial Classification, and acquire all the information respecting it which is useful or interesting. The work is then divided into two parts; the first containing the Linnæan or Artificial

System of all the Genera and Species. The second part contains the Jussieuan or Natural Arrangement of all the Genera, in such a way that a direct reference may be had from the Artificial System to the second arrangement, and again from the second to the first, without repetition of the species or any details connected with them." It is clear however that preference is given to the Artificial or Linnean System over the Natural Arrangement; though we feel confident that, in the present day, the latter would have been preferred. It was not so perhaps when the first edition was prepared, and there were reasons, probably of economy, for republishing that exactly in the same form, and giving the additional matter in two "additional supplements;" the first (in 139 pages) including all the plants originating in, or introduced into, Britain, between the first publication of the work in 1829 and January 1840, by W. H. Baxter, jun., under the direction of J. C. Loudon, and revised by George Don; the second (in 263 pages) including all plants so introduced between 1840 and March 1855, prepared by George Don, under the direction of Mrs. J. C. Loudon, assisted by Mr. David Wooster: the whole is concluded by a full Index of the systematic and English names, and the English and systematic synonyms in common use.

We are far from saying that the generic characters are in general sufficiently full or satisfactory to enable "an English reader," by which it is to be understood one little if at all familiar with Botany, "to discover the name of any plant he may find in flower," but it will often be a great help to him; and with due study and application, aided by the numerous figures and the index of popular names, a tyro may learn a great deal. It is of course, we need not say, a book of great value to the horticulturist, for it notices all the plants that have been, down to the present period, cultivated in our gardens; to the student of British botany, for the plants of our country are figured and described; and we now come to give the book its highest character, viz. it is the only portable botanical work that can be useful to a traveller in foreign countries, and we have repeatedly recommended it as a companion to such wanderers, to whom it has proved really useful, and we have on that account regretted it has been so long out of print. But here we would beg that we may not be misunderstood. It is not meant that it can take the place of the 'Flora of New Zealand' with the visitor to, or resident in, New Zealand; but, seeing that *that* is literally

the only extra-European country whose vegetable productions have been the subject of a complete Flora, the question is, how are travellers *in other regions* to obtain any knowledge of the botanical productions—take Africa, South America, the West Indies, for example—but by encumbering themselves with such partial and imperfect Floras as exist, together with the bulky (yet important, but nevertheless incomplete) volumes of De Candolle, Walpers, Kunth, etc.? True, the volume of Loudon before us makes no pretence, save in the matter of England, to represent a Flora of any country; but since, thanks to the progress of horticulture, a vast amount of the more interesting and beautiful plants of all parts of the world *are cultivated in England*, they find a place here, and are frequently illustrated by figures and by a great amount of historical information collected from various sources. Indeed, too much praise cannot be given to the work for the cleverness and general fidelity of the minute figures (*multum in parvo*), and the amount of knowledge to be obtained on the uses and properties of plants. Whenever it comes to a new edition, we trust the Natural Arrangement will be adopted.

COCKS, JOHN, M.D. (of Devonport): *ALGARUM FASCICULI*; a Collection of Dried Specimens of British Weeds, *carefully dried and preserved, and correctly named after Dr. Harvey's 'Phycologia Britannica,' with a description of each plant, time of appearance, locality, etc.* Small quarto. Dublin.

The great beauty of the family of plants intended to be illustrated by this work, the pleasure of collecting them during the summer and autumn seasons on the healthful coasts of England, at those times so much frequented, and the facilities for studying them by the invaluable writings and figures of Dr. Harvey, all conspire to render it a great favourite with those who are able to appreciate the works of nature. The present work is a further help to the study and knowledge of the species. Nor is this the first of Dr. Cocks' labours in this line. We have on a former occasion noticed his useful 'Seaweed Collector's Guide,' containing plain instructions for collecting and preserving *Algæ*, and a list of all the known species and localities in Great Britain. These two works, together with the volume of Dr. Harvey's 'Manual of British Algæ' (or the more costly 'Phycologia Britannica' of the same author, for those who can afford it), will render any one master

of the subject, and fit him to collect and preserve and correctly name the *Algæ* of the British shores. The first fasciculus of the 'Algarum Fasciculi,' now before us, is, as might be expected from the author of 'The Seaweed Collector's Guide,' very neatly got up, and the specimens are beautifully displayed and preserved. In this latter respect there is nothing to be needed; but we should have been glad to have seen *fructified* specimens, wherever they can be had (and in this there is no difficulty with the majority of the species, if sought at a proper season of the year); and we think that the wrapper bears an expression in the title, "with a *description of each plant*," which is not borne out by the contents. We find no *description*, nor even a specific character. Each fasciculus contains ten species.

SCHOTT, H.: AROIDEÆ. *Fasc. I. II.*, each with 10 plates. Large fol. Vienna. 1853-5.

In the excellent 'Meletemata Botanica' of Schott and Endlicher, those botanists have given characters of the genera, and an enumeration of certain species belonging to them, of the Family or Class *Aroideæ*; and, judging from two very beautiful fasciculi of the present work before us, Dr. Schott's object is here to describe, on a more extended scale, the genera and species. These descriptions are accompanied with a considerable number of figures, some coloured and some plain, admirably executed in lithography. In *Fasc. I.* the genus *Spathiphyllum*, Schott, (of which the well-known *Pothos cannaefolia* may be considered the type,) has nine species described and six figured. *Urospatha*, Schott, (to which belongs *Pothos sagittifolium*, Rudge,) has six species, and four figured. In *Fasc. II.* the figure and analysis of *Ambrosinia Bassii*, Mun., occupy an entire plate; a solitary species of the genus *Cryptocoryne*, Fischer, has five species described and two figured. *Lagenandra*, Dalzell, has only the *L. toxicaria*, figured also by us in the Journal of Botany, 1853, Tab. V. and VI. *Stylochiton*, Leprieux, is an African genus of two species, one figured. *Typhonium*, Schott, (of which *Arum trilobatum*, Linn., may be considered the representative,) has eleven species, and five are admirably figured, and with excellent analyses of the fructifications.

We trust that nothing will occur to impede the progress of this work, for it is alike creditable to the author and to the artist, and cannot fail to render great service to the cause of Botany.

Botany of VAN DIEMEN'S LAND. Extracts of a Letter from DR. HARVEY, dated Launceston, Van Diemen's Land, March 31, 1855.

About four weeks ago I received your very welcome letter of December 8th, by the 'James Baines'; and a few days ago your older letter of September 27 came to hand. I have already partially replied to the former through Dr. Hooker, and I have long promised myself to write you a fuller letter, which has been deferred from day to day; and now the mail is about being made up, I commence in rather a hurry. First, you ask for Van Diemen's Land alpine seeds, and I enclose a few, some few of which may I hope be worth having, though I send in fear and trembling of your pronouncing them all common and worthless. They are all *fresh*, and of my own gathering. I don't know whether you have *Decaspora thymifolia* in the garden, but it is well worth having, to bed out in an "*American*" bed, and is one of the most beautiful of the alpine little shrubs I have seen; covered in the season with pendent clusters of crimson flowers and violet-coloured *bloomy* berries, ripe while the flowers are in perfection; every twig which has not a cluster of flowers bears a bunch of berries. I gathered a great many more seeds on an excursion with Mr. W. Archer among the Western Mountains, but these I sent to our Irish gardens, as Mr. Archer was collecting for you, and will, I hope, take you a nice series when he goes to Europe next month. I have again written to him, to beg him to make sure of the *Telopia*, which was not ripe when I was in the country.

I arrived in Van Diemen's Land about the middle of January,—rather the fag-end of the season, as far as flowering plants were concerned,—and I remained four weeks at Georgetown, near the mouth of the Tamar, busily engaged with the Algæ. The neighbourhood of Georgetown appears, by all accounts, to be the best Algæ-ground in the island. It is here that Gunn has chiefly collected, and almost all the collections sent home are from this neighbourhood. Yet a person landing from the steamer at the town would pronounce it a most barren ground. The localities are varied in position, and situated from three to eight miles from the town, to be reached chiefly in boats, as the best are at the opposite side of the river. Fortunately for me, the clergyman (Rev. J. Fereday) has a boat, and a taste for collecting, and most kindly gave me every facility of exploring; generally going with me everywhere. The ground strongly reminds me of Bantry Bay; not so much the as-

pect of the hills, etc., as that of the marine flora. Everything that grows at Georgetown (as at Bantry) is of a huge size; the leaves extravagantly broad of the leafy kinds, and the stems of the branching ones proportionably long. The *Dasyæ* are commonly two to three feet long; so is *Polysiphonia Hookeri*, and even longer. I have seen bunches of *Griffithsia setacea* nearly two feet long, *G. corallina* almost as large, and *Callithamnion* which might be laid out so as to cover a large sheet of cartridge paper. From a single plant of *Laurencia dasyphylla* I made thirty or forty good-sized specimens; each secondary branch being sufficient for a folio sheet: no paper would have been large enough to lay down the specimen entire. The same luxuriance distinguishes most others. I have not myself gathered *Martensia*, but Mr. Gunn has fragments of its *fringe* (without the membrane) which indicate that the perfect specimens must have been at least a foot in diameter. It appears to be very rare, as he only once found it, and Mr. Fereday only once; and both were after gales some years ago. *Claudea* seems to be pretty generally distributed through the estuary, though very rare, except in one or two places where it is abundantly cast up; I have not found it growing. The best locality for it is at Point Rapid, about ten or twelve miles higher up the river than Georgetown: I call it *river*, but the water is perfectly salt for upwards of thirty miles, and in many places very deep; and to this depth of water, and the quiet shelter which the plants enjoy, are no doubt to be attributed the extraordinary luxuriance which they attain. My Georgetown collection is considerable, but does not include many new species: however, the specimens are greatly better than any we have yet received from these parts.

The neighbourhood of Georgetown two months earlier in the year would have afforded many flowering plants; most had however passed flowering, and my time was too much occupied with *Algæ* to seek closely after those that remained, which I thought the less necessary as no doubt Gunn has already sent them all home. Most of my excursions were in boats to different points of the river, where we had barely time to remain to collect *Algæ* before the tide changed; the tides being very strong in the river, and in some places perfect *races*. We took one land excursion however, a walk of about nine or ten miles to a promontory called "Five Mile Bluff," on the north-east coast, the track going partly through a thin gum-tree forest and partly over a

bare heathy country. I noticed very few plants in blossom; two or three *Orchideæ*; the usual *Leucopogons*, of which there are species everywhere, and always in blossom, but whose distinctions I can never keep in my eye; and I never know (unless it be a very remarkable one) whether I have seen this or that *Leucopogon* before; *Corræa speciosa*?, a few straggling flowers open; and a pretty little blue *Utricularia*, are all I remember. Round the Bluff, by the margin of the sea, *Alyxia buxifolia* was abundant; I had seen it in similar situations previously by the shores of Port Phillip. Its wood has a remarkably sweet scent, and when burned perfumes the room like a pastile.

We took a tent with us and passed the night at the Bluff, and I made my *début* as a fisherman on the occasion. Mr. F. is an old hand, and brought with him a seine-net, with which we dragged a large, rather shallow tide-pool. I was sent into the water, to cross the pool with one end of the net; and thought it rather cold fun to have to stand up to the middle in the water, and then shivering on the rocks at the opposite side, while the net was being slowly hauled round. Had it been to enclose *Claudeæ* or *Martensiaæ* I suppose I should not have felt the cold, but for the sake of merely *flounders* and *garfish* I found it rather a martyrdom. However, our fish supper in the tent was most excellent, and Mr. Fereday's cooking deserving of the highest praise. Next morning was very cold, and we did not renew the fishing; but after a fruitless exploration of the beach for *Algæ*, we returned to Georgetown.

Many common English weeds are naturalized about Georgetown, and some are perfect pests. *Horehound* is everywhere by the roadsides, and *Chamomile* covers the fields and paddocks; in many places to the exclusion of Grasses. *Thistles* are fast going ahead, all through Van Diemen's Land, and no one seems to trouble himself with them, although I have seen, I suppose, hundreds of acres given over to them, and growing so thick in some places that I have walked over my shoes in the bed of thistle-down which had blown from the withered stems. *Sweet-briar*, originally introduced as a hedge plant, is completely naturalized, and in places forms impenetrable thickets. It annually produces millions of *hips*, and, if let alone, will soon become as great a pest as the thistles. The common *Furze* is also spreading, but not so rapidly, in the western country. The Hawthorn grows perfectly, and forms excellent hedges as at home, but keeps within bounds; though it,

too, fruits abundantly. I have seen Oaks heavily laden with well-grown acorns; but there are no trees, as yet, of large size. Elms and Ash are occasionally cultivated, but are not common. I do not think I have seen any of the Pine tribe in cultivation, except a few recently introduced to the Botanic Garden at Hobart-town. The great staple, in the garden way, of the Colony is in Apples, Pears, and Plums and Cherries; all of which thrive remarkably well, and they have already raised some seedling apples and plums, which are well deserving of cultivation. There is a large trade in apples to Melbourne. The smaller fruits are made into jams or consumed at home; and often suffered to rot on the trees, from their abundance. Gooseberries, Currants, Raspberries, and Strawberries grow equally well. But Peaches and Nectarines are only fit for tarts, and often fall off before they are ripe. Grapes just ripen and no more, and are of small size. I have been here the hottest months of summer without experiencing greater heat than we often have in England. There is less rain, and a greater number of clear days; but on the whole I scarcely think the summers hotter than those of England. People here complain (as in all the Australian colonies) of the rapid changes of temperature; but with less reason for complaining than in any other country I know of. To me the climate seems as nearly perfect as a sublunary climate can well be.

From Georgetown I steamed up the river to Launceston, forty miles, the scenery of the river very beautiful, and strongly reminding me of that of the Hudson in New York, but on a much smaller scale. There are broad and narrow reaches alternately, and the banks vary from point to point; being sometimes steep and bold, and again sloping gently off to the more distant hills. Much of the land is still covered with forest, but cultivation increases as you approach the end of the navigation, where the town is built. It contains about 10,000 inhabitants. The streets are wide and macadamized, and the houses either of brick or plastered, or of wood, and of all sizes and shapes intermixed. Some of the streets are as steep as those of Clifton, as the town lies among several hills, in the forking of the two rivers north-east and south-east. The south-east flows through a narrow defile of the hills, continued nearly to the town, and about a mile up the gorge tumbles over some rocks at a place called "the Cascades," just above which is a circular depression surrounded by steep rocks, and with a pond in

the bottom. The entrance to the gorge reminded me of *Pfeiffer's Baths* in miniature, and the resemblance is increased by a line of water-spouts, by which water is conveyed from the pond to a mill just beyond the opening to the town. By much the handsomest of the common shrubs at this season is *Bursaria spinosa*, very abundant on the river-banks and borders of the woods, and covered with panicles of white flowers. They sometimes call it *Native Box*, from the nature of its wood; and sometimes *Native Myrtle*, from the scent of its flowers and wood; but its aspect is more that of *Privet* in full blossom.

On *Valentine's Day* I left Launceston by the afternoon coach for Deloraine, thirty miles distant, where Mr. W. Archer proposed to meet me and take me to his place, "Cheshunt," ten miles further west, among the mountains. The road to Deloraine is through an open but hilly country, much improved. We left the harvest saved round Launceston, but as we advanced to the westward the season was sensibly later, and after twenty-five miles the fields of corn were quite green; so great is the influence of the more copious rains of the western districts. The difference in elevation was hardly sufficiently great to cause such a change of climate. They reckon nearly three weeks between the seasons at Deloraine and Launceston. Mr. Archer came for me next day, and I spent the following ten days very pleasantly in his company, making excursions to all sides round his house. He is one of the most western settlers in this direction, and surrounded on all sides by tiers of mountains at various distances. His farm of 14,000 acres is well situated for cattle, a considerable tract being tolerably level, and capable of being irrigated by a perennial river (the *Meander*) which winds through it: so he has green grass at all seasons. Here I saw many interesting things for the first time. *Gleichenia dicarpa* everywhere in the boggy spots. *Dicksonia Antarctica* in the wet and shady gullies of the hills (it ought to do *well* in Kerry and Devonshire); its trunks sometimes clothed with *Hymenophyllum*, and sometimes with pale green *Hypnum*, very beautiful. Mosses are abundant. On the river banks *Celery-top Pines*, *Podocarpus* bushes, *Fagus Cunninghamii*, and the noble Waratah (*Telopia*), with the singularly beautiful *Wax Cluster* (*Gaultheria hispida*), were the most striking things. The Waratah was past flowering; its leaves resemble those of one of the American *Rhododendron*, and its branching is not dissimilar. Under the bushes panicles of the cobalt berries of a *Dianella* looked like

hedge-sparrows' eggs strung on slender wires: I could hardly cease gathering them.

We spent two days in an excursion to one of the highest points of the neighbourhood, called "Cuming's Head," between 3000 and 4000 feet. It was a very fatiguing walk of six hours to the summit, the track lying through an excessively thick and entangled bush, among which we had to force our way; sometimes creeping, sometimes edging sideways, and often walking along prostrate logs of gigantic dimensions. In some places the whole undergrowth was made up of *Bedfordia*, growing close and rod-like. At about half the elevation we came on a dense forest of Beeches, and passed some Fern valleys; and at last emerged above the wood, to scramble up a steep ascent of piled rocks near the summit. On reaching the top we had to descend over the ridge about 100 feet to a table-land, where we encamped near some pools of delicious water, and where we enjoyed a little glimpse of alpine botany. Two species of *Leptospermum* were in vast abundance and in full flower on the summit, and many smaller shrubs were interspersed; as several *Eurybia*, a *Baccharis*, *Boronia rhomboidea*, etc. *Gleichenia alpina*, which Mr. Archer thinks is only an alpine form of *G. dicarpa*, and I am disposed to agree with him, covered the whole plain. *Drosera Arcturi* was blossoming by the margins of the pools. *Gentiana montana* in full flower, and *G. Diemensis* going out, and in seed; the former much the handsomest. I found specimens of Dr. Hooker's genus *Pozoopsis*, but whether a variety or species cannot say; it differs from his description in having hairy leaves. One of the most remarkable things on the table-land was the green cushions of many feet in diameter and very compact, formed primarily of a *Mniarum*,* but among which grow a great number of minute things,—as *Plantago Gunnii*, a minute *Composita*, and *Perrettia Tasmanica*, the latter completely buried in the cushion, except its berries and the tips of its branches. A very showy *Helichrysum* with short stems and crocus-coloured flowers was abundant, and some handsome *Senecios*. On the whole, the table-land was pretty gay, considering the lateness of the season: a few weeks earlier it must have been quite a garden. We descended a ravine at one side to see the Pines (*Arthotaxis lycopodioides* and *cupressoides*) which grow abundantly on the margins of a little stream, the woods round being com-

* Probably a Composite plant, *Scleroleima*.—Ed.

posed of Beech, *Atherospermum*, etc., with the usual amount of Gums (*Eucalypti*), and returned in the evening to our bivouac on the table-land. Next morning we collected seeds, etc., and then retraced our steps through the tangled jungle to Cheshunt. On ascending the day before we had lighted a fire, which by the time we returned had spread over many acres, and had reduced a great part of the *Bedfordia* obstructions to ashes; while many of the larger trees were still on fire and falling (like the summer avalanches of the Jungfrau) on all sides of us. The fire was still spreading, and by the end of the week, when I left the country, had burned the greater part of the mountain-sides and was still extending! All the result of a lucifer match! Several days while I was at Cheshunt the smoke from bush-fires on all sides was so great as to conceal all but the foreground of the landscape; the smoke looking exactly like a London fog.

From Cheshunt I returned to Launceston, and started for Hobart-town by coach, 120 miles, at a cost of £6 (£4 for seat and £2 luggage); the former rate (before gold-fields) having been 30s. The road is excellent, and the driving like that of Jehu; but the stoppages at every grog-shop on the way wearying. We regularly pulled up for a quarter of an hour to twenty minutes at every public house, and they are not far apart along the whole line. In Hobart-town I made a point to call on your correspondent Mr. Oldfield, but found that he now resides at the Huon, where he superintends a school. I saw his brother, also a school-master, and have since had a letter from himself. His brother told me that Augustus has no taste for his present occupation, and a strong desire to be a natural history collector and traveller, for which he seems well fitted; that he has a competent knowledge of mathematics and practical astronomy, sufficient to enable him to map his course correctly, and that he is full of zeal for science of all kinds. I mention this to you, as you may possibly have it in your power to recommend him for some collector's appointment, should you be called on by Government for one for any of the Australian exploring expeditions, failing Drummond or otherwise.

My only excursion in the neighbourhood of Hobart-town (except the ascent of Mount Wellington) was to Port Arthur, the convict station on Tasman's Peninsula, where I went in a Government steamer, and remained a fortnight, hospitably entertained in the house of one of the officers. Port Arthur is a very picturesque and well-sheltered harbour,

situated between the remarkable basaltic capes—Cape Raoul and Cape Pillar; the former of which we passed at a couple of cables' distance, but of the latter had only distant, but still magnificent, views. The shores are bold and high; and high hills, covered with a very dense forest and almost impenetrable *jungle*, rise behind the settlement. The rains are abundant, streams of water numerous, and nothing looks burnt up even in the midst of summer, as in other parts of the island. Fern-trees are so abundant that they use the split *logs* (if so you can call a fern-trunk) for making corduroy roads through the forest; and very pleasant roads they are to walk on, as the log feels both soft and springy to the foot. Many of the prostrate sections had formed new side-buds, and were throwing out fronds in such profusion that I think *Dicksonia Antarctica* must be a very hardy species, as difficult to kill as a willow. I recommend your importing a few casks full of trunks, which I dare say could be procured by addressing Dr. Milligan, Secretary to the Royal Society of Van Diemen's Land, and offering something for their Garden in exchange.* The Garden is under the charge of Mr. Newman; it is beautifully situated and well kept, but not very extensive, and ill supplied with water.

Port Arthur did not prove favourable for Algæ, but I added a few to my previous list; among which is *Adenocystis D'Urvillei*, an Antarctic Alga. Much of my short stay was wasted in going to different localities recommended by the residents, but which proved barren when visited. At Eagle-Hawk Neck I found a curious little *Callithamnion* about as big as a raspberry, floating in the sea in such immense profusion that the waves, as they broke along the beach, looked like outpourings of rather fluid raspberry jam. The sea was discoloured with it for a considerable space, and the officer on the station assured me that he had constantly noticed it thus at one end of the bay, but only there. I found a few scattered fronds elsewhere, but in no other place in plenty. The great *Fucus potatorum* (which I did not see on the north coast) is plentiful at Port Arthur; and Dr. Milligan tells me the natives eat it, and that he has tasted it as cooked by them. Its fronds resemble sole-leather, very thick and tough when wet. Pieces of these are first singed over a fire, then put to steep for some time in fresh water, and afterwards roasted and eaten crisp. Dr. Milligan says it was tasteless, but felt like food in the stomach.

* Fine specimens are growing vigorously at the Royal Gardens, Kew.—Ed.

*Botany of VICTORIA (Southern Australia). Extracts of Letters from
DR. MUELLER, Colonial Botanist, Victoria.*

Omco, 16th December, 1854.

After a prosperous journey over the central part of the Australian Alps, I will occupy a leisure hour or two to acquaint you briefly with the botanical results of my researches. Although I wrote to you only about a month ago, when returning from Mount Wellington (in Gipps Land), I may hope that another communication now will not be altogether unacceptable, as Dr. Jos. Hooker's master mind and diligent hands are now occupied in the elucidation of the Tasmanian Flora, for which a few observations on the plants lately gathered here may prove useful.

The want of time hardly permits me to enter into any other subjects but botanical; still I shall briefly mention that I am the first and only white man who has ascended the two highest summits in the Bogong Range, probably the loftiest in this continent, which will receive the names Mount Hotham and Mount Latrobe, if his Excellency the Lieutenant-Governor should be pleased to sanction them. Other snowy mountains which my bearings will connect with those already included in the trigonometrical survey of Australia, I beg leave to name, in respect to the following men, Hooker's Plateau, Mount Leichardt, Kennedy's Height, Mitchell's Highland, and Clarke's Peak. The boiling-water point was on the tops of Mount Hotham and Mount Latrobe equally 198° Fahr. (75° Réaum.),* although the former exceeds the altitude of the other by a few hundred feet. This equality was of course owing to the variation in the atmospherical pressure whilst the two observations took place.

The vegetation of these lofty mountains cannot boast of so many peculiarities as I anticipated: repetitions of Tasmanian forms, or of such as I had already observed in other parts of the Australian Highland, were by far prevailing. Amongst other novelties was a dwarf

* Our friend J. Ball, Esq., M.P., has forwarded us the accompanying note upon these data. " 75° Réaum. = 200.75° Fahr. It may therefore be presumed that the scale of his thermometer was not accurate, and it is impossible to derive any secure conclusion from such an observation. According to Professor J. D. Forbes, the reduction is very simple, being in the simple arithmetical ratio of 570 feet (as I recollect) to 1° of Fahr. for each degree below 212° at average pressure. This would give for 198° Fahr. an altitude above the sea of 7980 English feet, but for 75° Réaum. only 6413 feet."

Ranunculaceous plant, perhaps a *Caltha*, with sagittate heart-shaped leaves, of which the lower lobes are inflexed in a most remarkable manner. It was ripening its fruit at this time, and the white-sepaled flowers must be already developed, like those of the Snowdrop, when everything around is clothed in snow. The ice-cold water which flows over its root, and against which the petioles are secured by a slimy tegument of decayed tissue, cannot reach the fresh green of the leaves owing to the singular direction which they assume. The furrowed scape is either very short, or the always solitary flower sessile. It is accompanied by two species of *Oreobolus*, by a *Drosera*, with long creeping root, allied to *D. Arcturi* (growing out of *Sphagnum*), by a white-flowering *Richea*, *Pentachondra pumila*, *Ranunculus Millani*, a very fragrant *Slackhousea* (hardly rising above the ground), *S. pulvinaris*, and other truly alpine plants. *Orites diversifolia* (if not a distinct species, for I never saw it with toothed leaves) is frequent over the snowy regions of these mountains, as well as the *Calluna*-like shrub, which may be a kind of *Schidiomyrtus*. Of an umbelliferous genus described by Dr. Hooker I possess now the first specimens; knowing it alone from Walpers' work, I cannot at present remember its name. A *Ranunculus*, I presume your *R. cuneatus*, grows not only along with *R. Gunnianus*, but also frequently enough in an altitude considerably below that species.

You may imagine, Sir William, what a hearty welcome our old acquaintance *Alchemilla vulgaris* had when I found a few individuals of it here in the very heart of the Alps, viz. at the sources of the Mittu Mittu, not having seen this plant during the last seven years, when I left my native home. With yet greater pleasure I collected specimens of a *Veronica*, not unlike *V. serpyllifolia*, which grew here, and here only, as well as *Geum urbanum* and *Barbarea vulgaris*, promiscuously with *Alchemilla*. A white-flowering *Viola*, with cordate leaves, assists in the imitation of European plants, but does not venture to ascend to the high localities with so inclement a climate, to which the others penetrate. A peculiar *Leucopogon* and two or three species of *Epacris* form also additions to the Victoria flora. From the lower country I obtained *Calystegia marginata*, which I think is only a small-flowering variety of *C. sepium*; further, a little blue *Pigea* or *Ionidium*, not unlike a *Utricularia*, from the seeds of which I hope you will raise a fine additional pot plant for your garden. *Carex Preissii*, a *Pomaderris*, and an *Ozothamnus*, not previously found here, are identical with Van

Diemen's Land species; but a charming *Boronia* (*B. bijuga*) and a *Pimelea* (*P. axillaris*) seem to belong exclusively to these mountains. I have convinced myself now also that the true "locus natalis" of *Grevillea Victoriae*, which I saw here in all its glory, is the Alps; but the fruit was only developing, and I could not obtain a grain of seed from it. What an introduction to Kew Gardens would this plant be,—a plant that requires no protection in England, and will grow along with *Ligustrum*, Honeysuckle, and Lilac! Of a rufous *Prasophyllum*, perhaps *P. fimbriatum*, I could not find more than a solitary specimen. In vain I searched for the splendid Pines of Tasmania, for *Pimelea nivea*, and many other plants which adorn the mountains of that island. I hope to be more lucky at Mount Kosciusko, for which I am now steering. To the Cobboras I shall, in passing by, pay a visit again.

My return to Melbourne is fixed to be in March, for I wish to enjoy the society of our noble friend Dr. Harvey. How happy I should be could I find letters there then from you!

Buchan River, 22nd January, 1855.

Since I had the honour of addressing you last from Omeo I proceeded to the north-western branches of the Australian Alps, where I ascended all the most prominent heights, including Mount Kosciusko. I found the distribution of the alpine plants during this excursion to be more general, as I anticipated, but had the pleasure of first observing many species here in a sufficiently developed state to form a correct idea of them. Of most of the new species I procured a good supply, which I had however a great difficulty to keep dry against fog, and afterwards, in the lower ranges, against rain: only a few had ripened seeds. I am now preparing to revisit the Cabbage-tree country, beyond the Snowy River, which I had (on account of many unforeseen adversities—the hostility of the natives and the unfavourable weather) but little opportunity of exploring last year. I shall only be enabled to allude briefly to the more interesting plants from the Alps, which I lately discovered.

One of the most remarkable amongst them is assuredly a large-flowering *Ranunculus*, with generally numerous and always white petals, having much the habit of an *Anemone*. It grows very seldom below 6000 feet, and chiefly on springs and on the margin of melting snow. Five *Umbelliferae*, belonging to as many distinct genera, are associated with it, as also a dwarf inconspicuous Composite, with leaves much

like *Oreobolus*, a slender procumbent *Pentachondra*?, a monostachyous *Carex*, a rooting *Gnaphalium*, a very distinct *Plantago*, and a smooth *Craspedia* (*C. leucantha*), with white flowers and sphacellate scales. At the highest mountains on stony ground I was not a little struck with a diandrous plant allied to *Veronica*, having the leaves densely crowded in four rows. Accompanied it was with a small hispid *Haplopappus* and with a moss-like tufted *Arenaria*?

The Ranunculaceous *Caltha*-like plant with inward bent leaves, to which I previously referred, is frequent enough on the Munzang Mountains, and after having seen it in a more advanced state I am much inclined to refer it to *Caltha*. I am however entirely deprived of books during the expedition, so as to settle these questions at once.

Singularly enough, *Carex stellulata* fell into my hands abundantly in some parts of the Alps, occurring like *Alchemilla vulgaris* and *Veronica serpyllifolia*? None were in the lowland. *Lycopodium varium*, which appears hardly to be distinct from *L. Selago*, and *Botrychium Lunaria*, belong also to the higher country. But one of the most interesting additions to our Alps flora forms undoubtedly a little annual *Euphrasia*. *Orites*, the species from Mount Hotham, I saw ranging for miles along with a fine ovate-leaved lepidote *Eriostemon* or *Phebalium*: it has always entire leaves, and I may therefore consider it as a new species (*Orites planifolia*). *Coprosma nitida* is not rare in the Snowy Mountains, and two herbaceous plants, apparently new, of the same family, were also discovered in the lower country, together with a second species of *Solenogyne* (*S. pubescens*), a *Velleya*, which in Stuart's Herbarium I called *V. exigua*, a *Rutidosis*, I suppose *R. helichrysoides*, *Scirpus Rothii* (*S. triqueter*, R. Br.), and a very distinct glandular *Calotis*. Two interesting Mosses were growing on rocks which are constantly washed by the melting snow, one of them adding the genus *Andreæa* to the flora of New Holland.

After having traversed now the main chains of the Snowy Mountains in so many directions, that I am led to believe that the plants mentioned in this and the two previous letters, together with those noticed in my reports, comprehend almost completely the Alps flora of this continent, I wandered for days over the Snowy Mountains without being able to add a single species to the collections. I should be delighted, Sir William, in finding, after my return, Dr. Hooker's Flora of New Zealand, and what may be printed of the Flora of Tasmania,

arrived by your orders, so that I can draw a comparison in the botanical features of the Australian Highlands.

In case the weather continues long enough dry, I may have an opportunity, after my return from the Cabbage-tree country, to proceed to the sources of the Yarra or of the Latrobe river, as the almost impenetrable scrub along its banks may conceal yet many a botanical novelty or rarity.

Lake Wellington, Gipps' Land, March 1st, 1855.

Since I had the honour of addressing you (from Buchan, 22nd January, 1855), when giving you a short account of the alpine vegetation of Mount Kosciusko, etc., I have been travelling for about a fortnight in the lower south-eastern part of Gipps' Land. I collected in the Cabbage-tree country *Cissus Australasica* beautifully in flower; but I was again too late for *Celastrus Australis*, *Cocculus Harveyanus*, and others, which are yet required in an early state of development. The additional plants from this district were limited; *Lobelia purpurascens*, a *Camphoromyrtus*, a *Notelaea*, and *Solanum pungetium* are amongst them. On the coast, where a few Algæ were drifted up, I found the beautiful very fleshy *Senecio spathulatus*, *Zoysia pungens*, *Panicum paradoxum*, R. Br., and in morasses a *Lysimachia*, which appears to be identical with *L. vulgaris*; it is certainly indigenous, and offers a new instance of the wide distribution of swamp or water-plants over the globe. The *Lysimachia* is accompanied by more than a dozen of its usual associates at home. Here, on the coast, and in various other parts of Gipps' Land, I observed a *Solanum*, called by the aborigines Gungang, which promises to become an additional fruit-shrub of our gardens. I have not yet obtained the perfect ripe fruit, which is said to be of excellent taste, and of which the natives are passionately fond. It is next allied to *S. laciniatum*, yet widely different in more than a dozen characters. I beg to give here at once the diagnosis.* On Lake King I found *Eurybia viscosa*; a *Loranthus*, new to me, with nearly orbicular leaves, adhering to the stem and branches of *Banksia integrifolia*; *Zostera marina*, a fine Malvaceous plant with the aspect of *Malva*

* *Solanum vescum*; fruticosum, inerme, erectum, glabrum, ramulis alatis, foliis elongato-lanceolatis integerrimis vel medium versus longe laciniatis sessilibus, floribus corymbosis, calycibus semiquinquefidis ecarinatis, corollis brevissime quinquelobis cærulescentibus, filamentis filiformibus antheras oblongas luteas æquantibus, baccis magnis subglobosis viridibus.—This diagnosis will readily distinguish it from *S. laciniatum*, which has an egg-shaped orange fruit of a disagreeable taste.

Capensis; * and, in bud only, a noble aromatic tree which appears to be a new species of *Cryptocarya*.

But here my explorations drew suddenly to a close. Searching during intense heat for good specimens of *Potamogeton praelongus*, in the Tambo River, I exposed myself too long to the cold water of this mountain stream, and the consequence was that I became for more than two weeks stretched on a sick bed by a rheumatic fever. I am now recovering. The illness did not, as I was much afraid, assume a serious character; but it will be questionable if, before the rain sets in, I shall have recovered sufficient strength to pass Mount Bawban on my homeway, a mountain which I ardently desired to ascend. This morning I saw for the first time a fragment of *Potamogeton crispus* in Lake Wellington; *Wilsonia Backhousii* occurs here also.

It is further my intention to employ constantly a collector at my own expense. By my own journeys, purchases, and the emission of one or two collectors, I hope to have, after the publication of the Flora of Victoria, so much material at my command, that I can earnestly contemplate the edition of a universal work on Australian plants. For this purpose I flatter myself to have the co-operation of Drs. Harvey and Sonder. With your usual liberality you would no doubt permit the former to augment the number of my diagnoses by revision of Cunningham's and Drummond's plants. Dr. Sonder could, through the friendship of Fenzl and Klotzsch, obtain certainly many additions from the splendid collections at Vienna and Berlin; and I trust also to find means of getting contributions from Paris and from De Candolle's collections. Many thousand plants would pass unaltered from published works into the proposed Flora, and I think there will be no difficulty in enumerating 10,000 good species. The English language would perhaps also for such work be preferable. I should feel obliged for any advice from you in this behalf.

Botanical Gardens, Melbourne, 5th April, 1855.

Three letters of yours, which were received with much delight, lie at present unanswered before me. The first of them came about a month ago into my hands, but I hesitated to forward the already written answer, as I weekly expected to learn whether I had to remain in this Colony or not. This is at last decided, and I can joyfully say, to my satis-

* A genus allied to *Lagunea*; I think new.

faction. By the papers you will have observed that the once flourishing financial state of this Colony, which gave birth to so many useful institutions, has—for a time at least—entirely changed, and the abolishment of the scientific institutions (excluding however the University) was decided upon; great retrenchments were made in every direction and were necessary, and amongst others my department. The Legislative Council however took a different view, and a petition was moved for by Dr. Greeves, to be presented to his Excellency, for putting an adequate sum on the estimates for this year to enable me and several others to continue in office. I cannot doubt that the measure of the Legislative Council will receive his Excellency's sanction.

Before entering upon the details of your letters, to which I will refer point by point, I beg to acknowledge most thankfully the transmission of the books and seeds. The latter, a valuable acquisition, are already in the ground; and the former, for which I will remit by Mr. Archer, have proved already useful to me in many ways. The 'Musci Exotici' contain charming drawings, which must render muscology attractive to any botanist. Your Journal is always a pleasing recreation, and Dr. J. Hooker's 'Flora of New Zealand' will, to judge from the introductory number, be a guide to direct roads and correct directions through the labyrinth of Systematic Botany. It will open the eyes of many of our best botanists, and especially of the continental ones, to what are the real limits of species. This highly important work will be most instructive to me. I have already seen that probably my *Caltha* will prove identical with *Caltha Novæ-Zelandiæ*, and certainly it approaches closely to *Caltha sagittata*: but thereon hereafter.

I have further to express my thanks for the trouble you have already taken in regard to a flora of this Colony, and for your writing purposely to our Governor and Colonial Secretary. The exertions also of our noble kind old Governor (Latrobe) will ever leave a deep impression on my mind, and I will write to him either by this vessel or by Mr. Archer, the Van Diemen's Land botanist, who goes for some years to England, bringing all his plants to you. He leaves in a few weeks, and I shall feel great pleasure in forwarding a set of alpine plants with him. I would have sent them with this vessel, but they will only arrive from Gipps Land at the very time when the 'Lightning' leaves. Dr. Greeves, member of the Legislative Council, and an ardent promoter of science in this Colony, will, upon my recommendation, transmit to you

a large quantity of *Atherosperma* bark. He praises it highly as a remedy in bronchitis, and I had myself an opportunity of becoming acquainted with its tonic properties. I have no doubt it contains an alkaloid of its own. It ought to be subjected to a good quantitative chemical analysis, and also be examined by medical gentlemen attached to hospitals, as it would perhaps form a precious article of export for at least four colonies. From Dr. Harvey I heard a few days ago: he is soon returning to this Colony, so that I can enjoy again his instructions and company. He discovered on these shores no less than four new genera of Algæ: is that not glorious?

This week Stuart, the Van Diemen's Land collector, goes at my expense to New Zealand. I directed him to the Middle Island, and it will give me much satisfaction to be able to increase thus your own stock of New Zealand plants. A few days ago I received also Dr. Meisner's remarks on my collections of *Proteaceæ*, *Thymelacææ*, and *Polygonææ*, going as far as 1852. I must candidly confess my regret that this active and acute botanist does not take a more enlarged view of the variations of species. Our science becomes more and more encumbered with synonyms; and in instances as *Grev. Australis* and *G. truncifolia*, Dr. Hooker's opinions, based upon so much more ample material, ought not to have been disregarded. I also regret to see nearly all my old names now in print. Most of these names have been *years ago* replaced by more correct ones; they originated mostly when I was very inexperienced here, and much more in want of books than now, and were only intended to serve in lieu of numbers, which by a slight inaccuracy lead at once to mistakes. I write by this mail also to Dr. Sonder, to make some observations that may be in time for De Candolle's *Prodromus*, and to give him also more information on the range of the species over the country.

I may be permitted to make in this letter a few passing remarks on these points. Meisner's *Grevillea triternata* is my *G. nulans*. I really believe the species is good, and I think the name might be altered now to *thyrsantha*. *G. pubescens* (non Hook.) is *G. Latrobii*, var. *pubescens*. I doubt also the distinction of *G. rosmarinifolia* and *G. Latrobii*. *G. Stuartii* I think is a variety of *G. Australis*. *G. micrantha* = *G. parviflora* (First Report, p. 17: and I think also *Hakea stricta* = *H. leucoptera*, Sec. Gen. Rep., an R. Br.?) *Mühlentseckia parvifolia* = *M. axillaris*. *Banksia prionophylla* = *B. Cunninghami*? *Pimelea dichotoma* I

received from Dr. Behr, its discoverer; the flowers of it are, as you will observe in the specimens forwarded last year, *white*, and during five years' observation of this plant I never saw them yellow, nor the bracts tinged yellow as those of *Euphorbias*. Moreover *P. dichotoma* is a real scrub and desert plant, whilst *P. flava* is entirely absent from South Australia, and only makes its appearance in the more southern latitudes of this Colony, where Tasmanian plants predominate. *P. nutans* and *P. cernua* are varieties of *P. linifolia*. *Grevillea Dallachiana* will, I trust, retain its name, for neither the appellation *alpina* of Lindley nor *alpestris* of Meisner can be admitted, as the beautiful shrub grows in the warmest parts of the ranges, and even frequently in the scrub of *hot plains*. If ever ascending to subalpine altitudes (and I am not aware of it), it will be, like hundreds of other plants, in a crippled state.

From Professor Lindley's remarks on my *Orchidaceæ* there appears to be still a good deal to be cleared up. It is my intention to describe accurately all the species. It appears to me so improbable that plants like *Caladenia mollis*, which have such extensive range over the country, should have escaped R. Brown. The *Microtis* so common through South Australia, Victoria, and Van Diemen's Land has been repeatedly examined by myself in a living state; it is unquestionably *M. media*, R. Br. *M. rara* and *M. parviflora* do not differ much from it. But I cannot adopt Lindley's opinion it should be *M. pulchella*. I examined *Microtis minutiflora* in a living state; and after having seen this plant now range as far as Gipps Land, I am inclined to take this for R. Brown's *pulchella*, notwithstanding it does not entirely accord with his diagnosis.

With regard to my intended Flora of Victoria, I think it best that I should publish it here myself, I dare say in the Government printing office, *i. e.* in English. Before however I can make the beginning to this work several districts have yet to be visited, one of which will probably produce many Tasmanian forms; others have yet to be examined in a different season.

By my next journey I think to complete the botanical survey of this Colony, and by the commencement of next year I hope to have, to my delight and instruction, the first fascicles of Dr. J. D. Hooker's Tasmanian Flora. I would venture then to follow with my own work, and I do not see material difficulty in bringing it out here.

Drapetes Tasmanica is an inhabitant of the Australian Alps. I ob-

serve that the character of *Thymeleæ*, as given by R. Br., with regard to the insertion of the stamens, must be altered according to this genus, what is neither done in Lindley's 'Vegetable Kingdom' (last edition), nor in Willkomm's new work. Of *Polygonum lapathifolium* I found here also the woolly form: it is R. Br.'s *P. lanigerum*: nor do *P. glandulosum* and *P. elatius* essentially differ from it. *Würlthia*, Regel, described in Professor Fournier's Flora, is identical with *Orthrosanthus*, Sweet; nor appears the species to differ from *O. multiflorus*. Have you seen Schuckhardt's 'Tremandrea'? It is a nice little pamphlet, with a good deal of additional information, although much of uncertain character has been mixed into the diagnosis; some of the general remarks require also a little alteration. A good character for distinguishing *Tetralthea* is offered also by the direction of the sepals in a fresh state; I adopted it in my own transmitted diagnosis of *T. baueræfolia*; but neither Steetz nor Schuckhardt could make use of it, as they saw only dried specimens. With much pleasure I perused the article of Mr. Drummond's exploration in the northern district of Western Australia. Several plants from Lake Torrens I think I can identify from his notes.

Note on BURSINOPETALUM, R. W. Icon.; by G. H. K. THWAITES, Esq., F.L.S., Superintendent of the Royal Botanic Garden, Peradenia, Ceylon.

As the opinions of eminent botanists are not in accordance as to the proper position of this genus, I have taken some trouble to re-examine very carefully one of our Ceylon species (C. P. 2441), fresh specimens of which have just been brought by my collectors from the jungles.

Bursinopetalum is placed by Dr. Wight, the author of the genus, in the Natural Order *Oleaceæ*, and Dr. Gardner approved of its being so located; Mr. Miers, on the contrary, is of opinion (Ann. of Nat. Hist. 2nd series, vol. viii. p. 169) that it should be arranged with the *Aquifoliaceæ*. I feel obliged to differ from these excellent botanists, and would suggest that this genus would be associated most naturally with the *Araliaceæ*, with the characters of which its own appear to coincide in every important particular. It is true that *Bursinopetalum* has a one-celled ovary, but the structure of its stigma would indicate the probable existence of very closely allied plants with plurilocular ovaries. The flower bears a considerable resemblance to that of *Hedera*,

agreeing with it in its all but inferior ovary, its large epigynous gland, its pyramidal style, its petals broad at the base, and, according to my observation, decidedly valvate, and these latter and the stamens being early deciduous. In addition to the characters just mentioned, the anatropal ovule of *Bursinopetalum* is pendulous from near the apex of the cell of the ovary; the seed is completely adnate with the tube of the calyx, and crowned with its persistent teeth and the scar of the large epigynous gland; the articulations of the branches of the inflorescence are constricted; and a resinous juice exudes from the trunk of the tree, similar to what is seen in *Hedera terebinthacea*.

The examination of specimens which had been subjected to drying appears to have misled Mr. Miers as to the real structure of the ovary and seed. I have been unable to discover any trace of the incomplete dissepiment mentioned by that acute observer; and the inversion of the putamen, by which the albumen is longitudinally deeply divided into two lobes, is not due, as is suspected by Mr. Miers, to the thickening of the placenta, for the groove or furrow caused by the inflexion of the putamen is on the back of the seed, the part most distant from the placenta. In the ovule a longitudinal depression is observable, which becomes deeper during the subsequent development, until in the ripe seed it has assumed the appearance mentioned above. In a transverse section of a very young seed, the ends of the vessels of the raphe may be very distinctly seen on the side opposite to that in which the depression occurs. I find the embryo with its narrow cotyledons very nearly equalling the albumen in length.

Note on the Development and Structure of the Integuments of the Seed of MAGNOLIA; by DR. ASA GRAY, Professor of Botany, Cambridge University, Boston, U.S.

By the phrase "semina baccata," Linnæus, and after him De Candolle and others, may be supposed to imply that the fleshy external investment of the seed of *Magnolia* is a proper seed-coat. Jussieu (Gen. Pl. p. 281) first suggested a different view, in his expression, "semina ossea, baccata seu arillata;" and Blume (Fl. Javæ) explicitly terms the pulpy covering an arillus: an idea which was adopted by Lindley and by Zuccarini (Pl. Nov. Hort. et Herb. Monac., fasc. 2),

etc. Endlicher seems to have adopted a nearly similar view, although he hesitated, as well he might, to call this covering an arillus; yet, in his 'Enchiridion,' he denominates it an accessory integument, enclosing the crustaceous proper seed-coat or testa. In the Genera Am. Bor. Illustrata, vol. i. pp. 59 and 61, I adopted the opposite and older opinion, and even called the outer integument the testa of the seed, notwithstanding its fleshy texture, on the ground that it represented the exterior of the two proper coats of the ovule. In a paper read before the Linnaean Society in November last (and reported in Ann. and Mag. Nat. Hist. for May, 1855), Mr. Miers has elaborately and ingeniously maintained this scarlet covering to be an arillus; and, after criticizing the grounds of my opinion, has concluded that "there is no reason to doubt that in *Magnolia* the scarlet envelope is due to a subsequent growth over the primine."

I should state that the view I adopted was not a mere inference "from the fact of having observed spiral vessels in the placentary attachment of the ovules;" but I had satisfied myself by continued and very easy observation that the exterior of the two coats of the ovule (a vertical section of which in *Magnolia glauca* is accurately represented by fig. 7 of plate xxii.), and to which the raphe belongs, is not covered by any subsequent growth, any arillus or accessory covering whatever,—but itself forms the scarlet envelope of the seed. Mr. Miers' observations have naturally led me to examine anew the ovules and young seeds of *M. glauca*, *umbrella*, *acuminata*, *costata*, etc.; and I must still maintain that this view is *thus far* perfectly correct, and abundantly easy to verify upon the living plant. Mr. Miers, however, is quite right in maintaining "the existence of an inner membranaceous integument around the albumen and within [what he calls] the true testa," the crustaceous envelope, and which I formerly overlooked, or else took (wrongly enough) to be derived from the embryo-sac: it is plain, also, that he is equally right in assuming this to represent in the seed the inner of the two coats of the ovule, and therefore in applying to it the name of tegmen. He is quite correct, moreover, in stating that "the raphe proceeding from the hilum is wholly exterior to and free from the bony coating,"—which is a valid reason against considering this bony coating to be the testa, as Mr. Miers does,—but he is less so in the further statement, that the raphe is "interior to the outer tunic." The cord of vessels in the ovule is involved in the middle of the mostly

internally thickened portion (the raphe) of the outer coat, which in the seed gives origin to the scarlet envelope, which therefore is no arillus; nor has this latter at any period an opening at the top, as an arillus must needs have. In it the cord of vessels, as may be seen in a vertical section of the ovule, divides into two bundles; one of them spreads and is lost in the chalazal portion of the outer coat of the ovule; the other passes deeper and at length terminates in the chalaza of the inner coat.

It only remains to reconcile Mr. Miers' undoubtedly correct statement, that the thin membrane adherent to the albumen of the seed represents the inner coat of the ovule, with mine, that the baccate covering belongs to the outer coat of the ovule; and this the dissection of ovules and young seeds of *Magnolia umbrellæ*, in various stages, enables me satisfactorily to do. I formerly took it for granted that the fleshy and the crustaceous coat of the seed belonged each to a separate coat of the ovule, and accordingly assumed that the outer seed-coat became baccate, and the inner crustaceous. But the seeds of *Magnolia umbrellæ* are already sufficiently advanced to show that the external coat of the ovule becomes *drupaceous* in the seed, its outer portion forming the fleshy, its inner the crustaceous, seed-coat.*

Botanical Objects communicated to the KEW MUSEUM, from the AMAZON or its Tributaries, in 1853; by RICHARD SPRUCE, Esq.

(Continued from vol. vii. p. 210.)

129. *Tangas* of Tururí bark. The transverse plaits in these are made with the teeth! They are painted with Carajurú. The *Tururís* are Artocarpous trees, among the loftiest in the forests. The commonest species has red bark; this white-barked one is called *Tururí-mórólinga* (white Tururí): I have not seen it in flower.

Note. Among the Uaupé Indians the *Tanga* is the only article of dress, barely sufficing to hide the nakedness. It is passed under the thighs and tucked in, before and behind, under a string which passes

* An independent confirmation of Dr. Asa Gray's views will be found in Drs. Hooker and Thomson's 'Flora Indica' (a work which cannot yet have reached Dr. Gray's hands), founded upon a detailed examination of the development of the seed-coats in the Indian species.—Ed.

round the loins. It is usually a rough strip of red Tururí, or a piece of curaná cloth of their own manufacture. What is singular is that its use is confined to the men; the women (except in their festas, when they wear tangas of plaited beads) going entirely naked.

130. Bone of a deer, with attached cord of monkey's hair. This is fastened by the hair of the head below the occiput, and the cords hang down the back.

Note. The Uaupé Indians allow the hair to grow long, and part it along the middle of the forehead, after the fashion of women in other countries.

131. "Tail" of monkey's-hair cord. Worn hanging down the back, the loop being fixed over the deer's bone.

132. Comb. This is worn stuck into the back-hair of the head along with the tail. The teeth are of the stem of the Bacaba Palm; they are inserted between two masses of monkey's-hair cord, which are encased in slender strips of the culm of *Gynerium saccharoides*, interwoven with thread of curaná. The free ends of the cords hang down the back and are ornamented at the extremity with parrot feathers.

133. Scapular plumes of the great white heron, inserted by twos, threes, or fours into tubes of Uarumá (*Maranta Touchat*, etc.), which are then woven tightly together with monkey's-hair cord. It is also ornamented with wing-feathers of the same bird, from which the stem has been stripped away, and with a tuft of mutún down on each side. There is a long pin of paxiúba in front, which is either passed through the loop of the tail aforementioned, so that the plumes point forward; or it is stuck in perpendicularly at the back of the Acanga-tára (123) so that the plumes stand erect.

134. Tail-feather of Aráru (macaw), with mutún feathers at base and a strip of quill-feather of heron near the point. This is stuck by the pin of paxiúba into the same loop, but so as to point backwards.

135. Arm ornament of parrot-feathers fastened to monkey's-hair strings, and meeting over a hollowed fruit of Tucúm (*Astrocaryum vulgare*), into the cavity of which a small pebble has been inserted. This is worn over the elbow.

136. Another arm-ornament. The hollowed cones are cut out of the seed (albumen) of Tucúm. The feathers are those of toucans and parrots.

137. Two pairs of garters, woven of curaná thread and painted with

taná (yellow earth) and *carajurú*. Children wear similar garters almost from infancy, and the leg just below the knee is so tightly compressed by them that a deep and permanent impression is produced.

138. Beads, worn shotbag-wise, over the left shoulder and under the right arm.

139. Box, in which the above articles are contained. It is made of the pinnæ of the frond of the *Uauassú* (*Attalea* sp.) crossed by tucúm-string. The frame of the top and bottom seems to be paxiúba.

140. Shield, of the sipó called *Timbo-titica*. It is partially smeared with pitch of *Ananí* (*Moronobea globulifera*).

141. *Banquinho*, or stool of the Uaupé Indians, cut out of one piece of some soft wood. The top is stained with red and black, but I have not yet learnt the ingredients used.

142. Instrument shaped like a tuning-fork, used for supporting the great cigars smoked on state occasions. The sharp end is stuck into the ground, and the Tucháua (being seated on a *banquinho*) supports his cigar of 18 inches or more in length between the forks. The wood is *pao d'arco*. The carving is coloured yellow with *taná*.

143. *Curabí*, or poisoned arrows, of the Uaupés, and two bows of the same Indians. Arrows: shaft of *Gynerium saccharoides*; head of *pawiúba* (*Iriartea exorrhiza*, Mart.) wrapped with two kinds of thread; that nearest the base being of curaná, and that next the point of the *pellicle of the frond of the Murití* (*Mauritia* sp.). The poison with which the heads are anointed is *Uirarí*. Quiver of Uauassú, wrapped with a broad strip of *Oambé-címa* at mouth, below this with monkey's-hair string, then with a lattice-work of Uarumá crossed horizontally with Oambé; and the wrapping at the end is of curaná, pitched, and coloured with carajurú. Bows of *pao d'arco*, strings of Tururí bark, which is said to be stronger than either curaná or tucúm: they are waxed with gum, either of *Ananí* or of Cumá.

Rem.! The Indians prefer leaving the strings of their bows rather rough, as a security against the arrow slipping in the act of shooting.

144. *Curabí* of the Macú Indians. These arrows differ from the above in having the head of *müra-piranga*. The wrapping is of cotton and monkey's-hair cord in place of curaná, but there is the same wrapping of the beautiful murití-thread next the poisoned part. The *Uirarí* of the Mucús is more deadly than any other. It is said to be the milk of some tree, which is applied fresh to the arrows every time they are to be used.

145. *Taná*, or yellow earth, used by the Uaupés for painting pottery, ornaments worn in dances, etc.

146. Bark of *Tururí*. (2144 to Bentham.) The tree from which my specimens were taken measured 110 feet, and was proportionally thick. It belongs to *Artocarpeæ*, and exudes a greenish milk when wounded. The bark is stripped off in precisely the same manner as is described by Lindley (Veg. Kingd. 271) for *Lepurandra saccifera*, Nimmo. It is used for caulking canoes, making bags, tangas, bow-strings, and a variety of other purposes.

147. Portion of the trunk of the *Mulongó*, used on the Rio Negro for corks and floats of fishing-lines, for which it is well adapted by its softness and lightness. I have not yet seen flowers of this; it is a small Apocynaceous tree, frequent in the gapó, but it is not the *Plumeria Mulongo*, Benth. (which was shown to me as *Mulongó* on the Tran-bétas), and its habit is that of a *Peschiera*. Stems of this thickness are very rare.

148. Wood (portion of twining stem) of a *Menispermæa* (2192 to Bentham) called *Abúta*. The bark and root are considered excellent remedies in disorders of the stomach and bowels, internal tumours, menstrual obstructions, etc.

149. Small bucket, used on board canoes on the Amazon and Rio Negro. It is merely a hollowed cúa, with a handle of piassaba attached to two crossed bands of netted curaná cloth.

150. *Acanga-tára*, used by Barré Indians of São Gabriel in their dances. Formed of two tiaras united, the one being of plaited Uarumá, with feathers of Toucan and down of Mutún, and the other of . . . , with the long tail-feathers of the scarlet macaw, tipped with the down of the *gavião réal*.

151. Comb of Uaupé Indians, used for combing out the long hair, as well as for hunting the "*Kínas*," which always abound there. (See 132.)

152. Two *Ambaiúbas*, or drums, of the trunk of *Cecropia peltata*, used by the Indians of São Gabriel in their *Dabocurís*, or festas. They have been hollowed out by means of fire, and the lower end closed with fresh leaves, beat hard down with a pestle. The performers in the dances beat them on the ground in unison with the movements of their feet. (When the leaves decay and fall out, the drum no longer gives its proper sound.)

153. *Iriartea ventricosa*, Mart. (*Paxiúba barriguda*, or big-bellied Paxiúba of the Brazilians). (Branches of spadix with fruit, young spathes, and pinnæ of fronds.) Serra de São Gabriel. Frequent on the Upper Rio Negro, and ascending high into the mountains. Height (including cone of roots, 5 feet 6 inches) 63 feet to insertion of fronds. Trunk 8 inches in diameter, from base to middle, where it begins to swell out; reaches its greatest thickness (20 inches) at 10 feet 6 inches from the apex; thence tapers again to insertion of fronds. Fronds few (about 7), 19 feet long; sheaths scarcely any. Spadices 22 inches long (including peduncle, 10 inches); branches simple or forked from very near the base, pendulous, subcontiguous by their dilated bases.

154. *Astrocaryum* sp.—Igarapé in falls of São Gabriel. These fruits were brought me under the name of *Tucúm*, but they can hardly belong to *Astrocaryum vulgare*, which is not described to have leproso-tomentose fruits, like these.

155. Pinnæ of the young fronds of *Tucúm* (*Astrocaryum* sp.), from which maqueira-cord is made. The cuticle of the outer (upper) surface is the part used. To obtain it the leaflet, when fresh, is split along the midrib into two parts, and each of these is doubled down near the base by a sudden motion, which causes it to break across, with the exception of the cuticle, which being more tough, remains unbroken, and is then laid hold of and stripped off in a piece.

156. *Maqueira* (hammock) of Murití.—The cord from which this is woven is made from the cuticle of the fronds of the Murití Palm, which is stripped off in the same manner as that of the *Tucúm*. Hammocks of Murití are softer, but less durable than those of *Tucúm*.

157. Petiole of *Caraná-assú* (*Copernicia* sp.) with the skin stripped off, in which state it is used on the Rio Negro for corks, bird-cages, etc.

158. Shells of some fruit strung together, and tied round the right ankle in the *Dabocurís* (dances) of the Barré Indians, producing a loud rattling noise with every movement of the wearer. They come from the Rio Içanna, and are possibly the stone of some drupe.

159. Pod of the *Ingá-péua* (i.e. *flat Inga*). Planted in sitios near São Gabriel, but I have not yet seen fruit of this *Inga*.

160. *Salsa-parilha* do Rio Negro.—Stem, leaves, and fruit of a plant brought from the Rio dos Caburís. This is the true sarsaparilla

of the Rio Negro, and the Indians assure me that they never take the root of any other species.

161. Fruit called *Macucú*, used in giving the black varnish to cuyas. It is produced by a Chrysobalanaceous tree of moderate size, growing on the inundated shores of the Rio Negro. (2197 to Benth.)

162. Fruit of the *Cocúra* (in spirits). (2023 to Benth.) Mature fruit blackish-purple; the capsule free from the enlarged perianth, the interstice being filled with sweet turbid mucilage, which is the part eaten. This has more eating than the *Cocura-l*, but is scarcely so pleasant. It belongs to *Artocarpeæ*, and is probably a *Pourouma* of Aublet.

163. Fruit of *Ucuquí* (in spirits), and leaves. This belongs to a lofty milky tree (an *Artocarpea*?), frequent on the upper Rio Negro. Fruit very milky, dull yellow, sometimes tinged with red. Epicarp $\frac{1}{8}$ of an inch thick, yellow, softish, but brittle; mesocarp $\frac{1}{2}$ inch, of same texture as epicarp, but dull red; endocarp a thin, tough membrane, closely investing the seed, and beset on its outer surface with long fibres (free from the mesocarp), immersed in viscid gelatine. The thin fibroso-gelatinous mass is the only part eaten. When fresh it is sweet, but acrid, leaving a burning and itching sensation in the mouth: this acidity passes off in roasting. A pleasant wine is prepared from this fruit.

164. Salt made from various species of *Podostemeæ* (called *Caarurú* in Lingoa Geral). It was purchased from Indians at the fourth cataract of the Uaupés, to which the name of *Caarurú-cachoeira* has been given, from the abundance of *Podostemeæ* growing on the inundated rocks.

165. *Ipadú*, made at Urubucóaru, above the second cataract of the Uaupés; mixed with the powdered Coca-leaves is a small quantity of Tapioca, ashes of *Cecropia*, and juice of Sugar-cane; the last ingredient serving to make the *Ipadú* more palatable.

166. Portions of the stems of a Malpighiaceae twiner, apparently an undescribed *Banisteria* (2712 to Benth.), called by the Indians *Caá-pí*, and of the roots and leaves of a *Hæmadictyon*, called *Caapí-pinima* (i. e. painted Caapí), the leaves being veined with red. From these ingredients (the *Banisteria* entering much more largely than the *Hæmadictyon*) is prepared an intoxicating drink known to all the nations on the Uaupés by the name of *Caapí*. In the Dabocurís (or festas)

of the Uaupé Indians, the young men who figure in the dances drink of the Caapí five or six times during the night, the dose being a small cuya, the size of a very small teacup, twice filled. In two minutes after drinking it its effects begin to be apparent: the Indian turns deadly pale, trembles in every limb, and horror is in his aspect; suddenly contrary symptoms succeed: he bursts into a perspiration, and seems possessed with reckless fury, seizes whatever arms are at hand—his murucú, cutlass, or bow and arrows—and rushes to the doorway, where he inflicts deadly wounds on the ground or doorposts, calling out, “Thus would I do to such a one (naming some one against whom he has a grudge) were he within my reach.” In the space of ten minutes the effects pass off, and the Indian becomes calm, but appears much exhausted.

167. Ornamented Hammock (called *Maqueira* in Brazil, *Chinchorro* in Venezuela); made at Tomo, on the Guainia (Upper Rio Negro). The body of the hammock is made from the fronds of *Astrocaryum vulgare* (called *Tucúm* in Brazil; *Cumári* in Venezuela). The borders are an open network made from the fronds of *Mauritia vinifera* (called *Muriti* in Brazil; *Moriche* in Venezuela); the white feathers with which they are ornamented are those of the royal heron, the black of the curassow, and the rest are of parrots, macaws, humming-birds, etc.; the cords are of *Tucúm*.

168. Portion of stem and leaves of a species of *Schnella*, from forests on the Rio Uaupés. All the twining *Bauhinia* have similar compressed sinuated stems, sometimes exceeding a foot in breadth, and ascending to the tops of the highest trees. From their singular conformation, the Indians call them *Jabotím-mitá-mitá*, i. e. “Land-turtle’s ladder.”

169. Musical instruments used by Indians on the Rio Uaupés. They are made of the slender branches of a tall Bamboo which seems anciently to have been planted near all the Indian settlements. The “reeds” are used also throughout the Guainia, Casiquiare, and Orinoco, where they are called “Carízo.” The peculiar dance in which they are used bears the same name, which means simply “bamboo.”

170. Indian “bellows,” made of strips of the leafstalk of *Tucúm*, from the Rio Uaupés.

171. A pair of drumsticks, used throughout the Uaupés for beating the big drum (called in Lingoa Geral *Turucána*, but by the Tariana

Indians *Dulípiru*, and by the Tucáns *Tuati*). The drum is a portion of the trunk of a Lauraceous tree called *Myrdaná* = *Páo amarello*, sometimes ten or twelve feet long by two feet in diameter, partially hollowed by fire, which has been introduced by four circular orifices along the upper side, the ends being preserved entire. The deep hollow sound is heard for miles, and serves as a signal for the gathering of the tribes to some feast, or to resist the incursion of some enemy. The use of the Turucána seems anciently to have been general throughout these rivers, but it is now confined to the Rio Uaupés.

172. Two baskets and four sieves made by Uaupé Indians of the rind of the stem of *Uarumá* (various species of the *Maranta*). These articles enter largely into the commerce of the Rio Uaupés.

(To be continued.)

Notes by HENRY H. CALVERT, Esq., on Vegetable Products sent by him from Erzerroom, etc.

1. *Tchirish* is the root of an *Asphodelus*. In Jaubert's 'Voyages en Orient d'Aucher-Eloy,' p. 200, he mentions the *Tchirish* plant to be *Asph. ramosus*, but you will see by the specimen marked No. 1365, sent to Dr. Lindley, that Jaubert is in error. The roots of this plant are dug up in May, and after separating the young tubers of the year from the older ones (the former being finer in quality than the latter), the roots are bruised, dried, and then ground to powder, and in this state are exported from Koordistan to various parts of Turkey. Its adhesive qualities render it useful to saddlers, shoemakers, bookbinders, etc., and for "filling" for the coarse native cotton cloth, etc., wheaten flour paste never being employed in this country as a gluten. To make *tchirish* paste the powder has merely to be added gradually to cold water and then stirred. (Pouring water on the powder is not so effectual, as the *tchirish* clogs into lumps.) In May and June the young shoots are sold in town as a vegetable. When cooked, green *tchirish* has a taste intermediate between spinach and purslane, with the glutinous property of okra (*Abelmoschus esculentus*); in fact, it is by no means a disagreeable vegetable. I had hoped to have sent you seeds; but, in the disturbed state of the country, I could not induce any one to go for them.

2. *Lecanora esculenta* and *L. affinis*, from the neighbourhood of Bayazid. For information thereon see 'Gardeners' Chronicle' for 1849, pages 581 and 611.

3. *Piré-oti* (which means Fleawort) is exported from Koordistan to various parts of Turkey, for the destruction of fleas, which it certainly does most effectually. It suffices to strew some of the powder inside a bed or over a sofa or carpet, to kill or drive the intruders away. The English and French officers made an excellent use of this drug in the Turkish barracks. I have not yet been able to ascertain the plant from which it is obtained; I thought it was a *Pulicaria* from the similarity of smell of the dried pulverized leaf, but a native tells me that such is not the case; and he described to me a plant with a white flower, yellow disc, and divided leaf, which leads me to think the *Piré-oti* is a *Matricaria* or *Anthemis*. I believe the two samples of *Piré-oti* are more or less adulterated, for I have seen some much stronger in smell, but I could not find better qualities for you.

4. *Salep*. I do not know what *Orchis* produces it: it is usually sold in powder.

5. *Henna*. The shrub from which this is obtained (which I suppose is *Lawsonia inermis*) is cultivated in various parts of Koordistan, Persia, and Syria. There are two qualities of henna powder; one is obtained from the stems (reckoned the best), and the other is derived from the leaves; these are picked off the shrub and are ground up with lucerne leaves, whereby the dyeing quality of the drug is supposed to be retained and strengthened. The preparation of the henna for application to the hair or skin, is to put the powder into boiling water, stir it, allow it to boil well, and then leave it near the fire for a couple of hours, until the mass becomes like a paste, when it is ready. It tinges the hair or skin of an orange-colour.

6. *Fish-poison*. I cannot tell from whence this is brought, and whether it is produced in Turkey or Persia. The berries are pounded, mixed with chopped meat, or flour paste, etc., and is then thrown into a place abounding in fish. In the course of ten minutes, the intoxicating effects become apparent, and the fish are easily caught by hand, alive or dead. Can you tell me what it is? [It is *Anamirta Cocculus*.—ED.]

7. *Gum Tragacanth*. Only two qualities are imported here. The gum exudes naturally from the crown of the roots of the *Astragali*,

without the necessity of incision; and it is abundantly collected by the natives. The white quality of gum is produced by *A. echinus* (No. 529), and the brown kind by No. 881 A. (See my herbarium, sent to Dr. Lindley.) Both these plants abound near Erzerroom, but on none have I ever detected any gum; perhaps the climate is too cold for its production. I showed a native all the other kinds of thorny *Astragali* in my herbarium, but he said none produced gum, except the two species above mentioned.

8. *Squill*? brought from Van. Pounded and mixed with salt, these bulbs are used for the relief of rheumatism, by rubbing them in on the part affected; but if continued too long, the skin is liable to be blistered.

9. *Papaz-oti* (meaning "priest-herb"). I have not been able to ascertain to what use this drug is applied. It does not appear to be much known here: it comes from Egypt. Pray tell me, if possible, the genus of the plant from which it is collected. [*Veratrum*, Ed.]

10. *Bolgoor* is wheat used instead of rice for *pilass*, or in soups like pearl barley. It is thus prepared:—the grain is first washed, and then boiled so as to become soft; it is afterwards spread out to dry, and, being mixed with a little water, it is beaten in a large stone mortar with a heavy wooden pestle, whereby the husks are loosened, and being then ground in a hand-mill, the operation is completed.

11. *Petmess* is the inspissated juice of grapes. To six parts of fresh grape juice is added one part of strong clear ley of oak-ashes, and the whole is boiled until, by evaporation, it is reduced to the consistency of treacle, which in taste and appearance it much resembles. (I may here remark that raisins are prepared by dipping the fresh bunches of grapes in hot strong ley, and hanging them to dry.)

12. *Pastil* is merely a mixture of *petmess* with flour, made into a paste, and rolled out into sheets, or made into other shapes, and then dried.

13. *Poisonous honey*. This honey, as is well known, is rendered deleterious by the bees feeding on the flowers of *Azalea Pontica*. It is found all along the coast between Trebizond and Batoom. Its sale is prohibited, but it is nevertheless often fraudulently sold, mixed and boiled with wholesome honey. [This is sent for analysis to Mr. Stenhouse.—Ed.]

14. *Dokooz-don*. The interpretation of this word is "nine coatings,"

on account of the numerous coatings with which the wood is covered. This wood is principally used to make ramrods; it possesses both strength and flexibility. Can you tell me what it is?

NOTICES OF BOOKS.

HOOKE, J. D., and THOMAS THOMSON: *FLORA INDICA; being a systematic Account of the Plants of British India, together with Observations on the Structure and Affinities of their Natural Orders and Genera*. Vol. I. *RANUNCULACEÆ to FUMARIACEÆ, with an Introductory Essay and two Maps*. London. 8vo. 1855.

There are few botanists or students of botany, whether in India or in Europe, who will not hail the appearance of this volume, as a forerunner of a complete Flora of the vast possessions of the British Empire in India, traversed by mountains the loftiest of any in the world, and consequently including in its area a vegetation the most varied, exhibiting all the gradations from that of the tropics to that of the most alpine character, and of every degree of humidity to that of the most dry character, where scarcely any rain falls throughout the entire year. Nor are the authors unknown to science or to fame: they have themselves explored the botanical treasures of no small extent of the regions just mentioned, especially the least known portions of the great range of the Himalaya.

Dr. Thomson has published his travels in Western Himalaya and Tibet, and Dr. Hooker his in Bengal, the Sikkim and Nepal Himalayas, the Khasia Mountains, etc. During the latter part of Dr. Hooker's travels also, Dr. Thomson was his companion; and since their return to Europe in 1851, their time has been mainly devoted to the preparation of the volume now before us, compiled from their own materials and the vast collections of Indian plants in the Hookerian and other herbaria.

Of this work 280 pages are devoted to an Introductory Essay of great value and interest, the contents of which will be best understood by a mention of the heads into which it is divided; viz.—1. Object, Scope, and Design of the 'Flora Indica.' 2. General Considerations connected with the study of Systematic Botany. 3. Subjects of Variation, Origin of Species, Specific Centres, Hybridization, and Geographical

Distribution. 4. Summary of Labours of Indian Botanists. 5. Sketch of the Meteorology of India, and 6. Sketch of the Physical Features and Vegetation of the Provinces of India.—So full of valuable matter is this Introduction, that its authors have, with great judgment and no small labour, given an excellent Index to it. The remaining 285 pages of the volume is devoted, in closely printed type, to the Flora; the generic and specific characters and full descriptions (when needful) in Latin; with observations, etc., in English, accompanied by a complete Index of Genera, Species, and Synonyms. The whole is executed with a degree of care and accuracy that will justify its being ranked with the most valuable botanical publications of this or any other day. Some may think that there is too great a disposition to reduce the number of species previously described: but if such persons were to come with an altogether unbiassed mind to a labour of this kind, and have access to the rich and varied materials which have fallen to the lot of our authors, and an equal amount of authentic specimens, they would probably arrive at nearly the same conclusions.

The map accompanying this Flora is a novel and valuable feature; it professes to divide the whole area under consideration into such provinces as shall, in general terms, be a sufficient indication of the geographical habitats of the plants described; and it designates these by names already familiar to geographers, and which should be also to naturalists. In this the authors have followed the excellent example of Ledebour's '*Flora Rossica*,' and we most sincerely hope that botanists will, in future, whenever they may have occasion to designate the locality of an Indian plant, adopt the divisions here proposed.

In the preface the authors announce their intention of continuing the work; but it seems very doubtful whether it is possible for them to enter with so much care into the details of the structure and affinities of the genera and species consistently with making due progress in the descriptive portion. Materials accumulate much faster than they can be fully studied with a view to their complete elucidation in a structural, systematic, and physiological point of view; and it might be better that Drs. Hooker and Thomson should content themselves with the proof the first volume affords of their ability to treat these difficult subjects, and conduct the remainder on a less comprehensive plan; the fact being, that in the present deplorable state of Indian botany we want a careful Prodrômus of the whole Flora, far more than a learned study of a few Natural Orders.



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Ecorementhus eximius, Thu

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Notes written on a Voyage from Singapore to Banjermassing, in the southern extremity of Borneo; in a letter from JAMES MOTLEY, Esq., to SIR W. J. HOOKER.

(Continued from p. 172.)

Machipora (Banjermassing, S. Borneo), March, 1855.

When I last wrote to you I gave you an account of my first attempt to reach Sumatra, when I was obliged to return to Singapore for a larger boat. I started again on the 24th of January with a Bugis prahu, of about four tons' burden, and six men besides my servant. I slept that night at a small settlement among the islands, which I have already described to you; and next day, about ten A.M., I got clear of the Archipelago and sailed down the coast of Sumatra: it is a mere line of low trees, and, as far as I could see, when the high water allowed us to approach it, of one species only, *Agiceras majus* I believe, called in Malay "Api Api." The natives assured me that for miles along the coast no other plant is seen, except in the creeks, where there is a little mixture of fresh water. The shore is exceedingly flat, of mud so soft that it is hard to say where it ends and the water begins. Though the rise and fall of the tide is not more than six feet, the beach dries for some miles out, and we were aground at low water, where we could only see the trees like a dark line on the horizon; indeed about 150 miles to the southward the coast has literally never been seen from the sea, even by the surveyors who made the charts, from the impossibility of approaching it in a boat sufficiently near. Not a break nor a hillock could be seen, nor indeed does one exist on the whole line of coast for fifty miles inland. The country can hardly be said to be dry land, and the whole coast is notoriously unhealthy, and swarms with tigers and other wild beasts. At ten P.M. we anchored just on the equator, off Taryong Daloo, close to which the water is perhaps deeper, and there is probably a reef of coral, as the sea made a great noise all night.

25th. We had no wind this morning, but it being high water we pulled along close under the Api Api jungle. The number of birds here is astonishing: there were flocks of sandpipers and plovers, which must have consisted of hundreds of thousands of individuals, looking at a distance like large clouds, and completely whitening the jungle where they perched. Of herons I counted nine species; all around us were fishing innumerable terns, of two species; knee-deep in the water, close under the bushes, stood long rows of tall black and white

ibises, looking like soldiers at drill, their heads laid back, their long flesh-coloured beaks resting on their white breasts; and every moment brilliant kingfishers glanced in and out among the trees.

About ten A.M. we came up to a tribe of a very singular race of Malays, the Orang Lant, or Men of the Sea; though they might with greater propriety be called men of the mud. There are said to be nine tribes of them; they live entirely in their boats, never quitting the coast, but moving up and down over a certain district at the rate of a mile or two each day. The Malays of Singapore and the natives of Singu Rhio and the interior of Sumatra come here to trade with them, exchanging rice, cloth, sago, and salt, for dried fish and Karang, a species of *Arca*, much used for food, and the shells of which are supposed to yield the purest and best lime for eating with the sirik and areca nut. They speak a little Malay, but have also a peculiar dialect of their own, which few of the Malays understand; and they are exceedingly averse to associating with other people, or marrying out of their own tribe. They differ a little in physiognomy from the Malays generally, the lower jaw being narrower, and the æ of the nose suddenly enlarged, as in the Papuans. A good many of the men had, for Malays, very strong black beards, and, though short, they are well formed; the calf of the leg is low down, large and decurrent; the shoulders high and broad, and the fore-arm muscular and well-developed. They are professedly Mahometans, but know very little about it, and retain many pagan customs, such as faith in augury, offering libations to spirits, etc., like the Dyaks of Borneo. Their language is said to resemble that of the Battas of the interior of Sumatra, a people I have not yet met with. This tribe was divided into two Kampongs, or villages as they call them, one of twenty, the other of about fifty boats of various sizes, and may have consisted of 300 to 400 persons. The smaller boats were laden with their fishing apparatus, to be hereafter described, and the larger formed their habitations. These boats are sheathed with thin planks or with the bark of the mangrove, to protect them from the Kapang, or teredo, so destructive in these seas; the longest were perhaps forty feet long, and of three or four tons' burden. A sort of house, not high enough to stand erect in, is constructed over the whole length of the boat, to the ridge-pole of which are usually suspended two or three infants swinging in small hammocks. The sides and roofs of these houses are completely covered with fish, split open and drying in the sun, giving out

a horrible stench, and attracting a vast number of hawks, who sailed round and round, swooping every now and then at the tempting morsels, and succeeded occasionally in carrying a piece off, in spite of the numerous naked urchins who kept guard with long sticks. There were four species of these birds, the most numerous being the red Brahminee kite of India: they were perfectly fearless, sweeping past close to one's head; and it was interesting to watch them devouring their prey on the wing, and really picking out the pieces of meat with their beaks from between their clenched talons. There were several Singapore prahus in company with these people, waiting to buy fish. As we rowed past, an extremely filthy old savage, who called himself Orang Kaya, or chief, came on board; he told us that his office was hereditary, and that every man of his family bore the same name, Pulek. He told me that his people sometimes entered the rivers, but only far enough to get fresh water to drink, which he said was very good. I felt somewhat interested about this matter, as I began to suspect we should be some time in reaching Indragiri, so I asked him to let me see it. He fetched a cupfull from his boat: it was muddy, nearly black, and not brackish, but so actually salt that I could not touch it; yet he drank it with great relish, and said it was better than the clear water we had brought from Singapore: so much will habit do in modifying human tastes. I exchanged with him some tobacco and an old pair of trowsers, to which he took a great fancy, for a bundle of dried fish for the boatmen; and after a most barefaced attempt to steal my short clay pipe (a high crime, for it was the only one I had with me), he took his leave, and we pulled on. We soon got aground however, about a mile from the trees, and were of course obliged to wait for the tide. Shortly afterwards the whole tribe was in motion, following us, and they moored themselves to poles stuck in the mud in a long line, of which our boat was nearly the centre. They now began to prepare their balat, or fishing weir; it was a sort of flexible paling, made of strips of bamboo, an inch wide and four or five feet long, fastened together by the twisted stems of a species of *Cissus* (this material, like their boats, they get from the Malays). This paling is doubled up and piled upon the small boats before mentioned, in lengths of 100 to 200 feet in each boat, and from these it is shot like a seine net, when the tide begins to ebb, in about six feet water, and in a line parallel with the shore; as fast as one boat was exhausted another was brought up, and a fresh length joined on.

A number of boys followed the boats, swimming, and with their feet striking the bamboos upright in the mud in a perfectly straight line, though it was impossible to see an inch into the muddy water. In a quarter of an hour they had laid down more than half a mile, besides a long piece at each end, at right angles to the main line, and moving up to the shore, enclosing altogether perhaps fifty or sixty acres of water. As soon as the water had ebbed far enough to allow the wakes of the larger fish to be seen as they swam about in this enclosure, the boys, taking advantage of the now unoccupied canoes, went paddling about after them with great agility, holding a long light spear, with the head of the paddle in the right hand, and seldom failing to transfix, even from a considerable distance, any unfortunate fish who ventured near enough to the surface to show his back free for a moment. When the water was about three feet deep, and the tops of the bamboos sufficiently above water effectually to confine the fish, the men began their work in good earnest. The fish, in their efforts to escape to deeper water, travelled along the inside of the enclosure, close to the bamboos, and the fishermen accordingly stationed themselves at intervals of about twelve or fourteen yards, with a large bag-net open against the set of the tide; the water is so muddy that the fish cannot see this net before they strike it, when it is immediately raised, and the captive secured. The mud here is so excessively soft, that it is impossible to walk or even to stand upon it; and therefore every man, woman, and child is provided with a strange instrument of locomotion, without which life would be impossible for these people; it is called "tongka," and is merely a piece of plank, about four feet long, and eighteen inches wide, rounded and slightly turned up at each end. I was much puzzled at first to imagine what these planks could be, of which I saw so many in every boat; but when the tide went down the mystery was soon solved. Supported on the hands and one knee on the "tongka," they paddled with the other foot in the mud, and skimmed over the surface with most wonderful rapidity, making the mud and water fly in all directions, and bespattering one another from head to foot with filth, which of course cannot be washed off again until the tide rises,—a matter which distresses them but little. A brisk intercourse was now kept up from boat to boat by this means, and you can conceive nothing more absurd than the attitudes and action; it all looked natural enough as long as it was confined to the naked children, but to see grey-

headed old men and women scuttling away among the sludge, and plastered with mud all over their grave wrinkled brown faces, was really most ridiculous: they looked so very little like human beings, that I felt almost surprised to hear them speak. From this mode of life the women are obliged to wear most grotesquely short drapery, not reaching their knees; and the upper part of their dress being in the usual Malay style, this too gives them a very odd appearance. The quantity of fish caught was very great, judging by the success of those near me; they were chiefly *Scombridæ* and *Pleuronectidæ*, but there were many other species. Two or three small sharks were taken; their flesh is highly valued. I saw several specimens of a ray, covered with blue spots and with a formidable spine near the base of his long filiform tail: this fish is much dreaded by the natives, and with good reason; it is exceedingly venomous. I have seen a European at Labuan suffer for twenty-four hours intense pain from a scarcely visible puncture in the ankle from one of these fish; the pain was accompanied by vomiting, shivering, spasms, and other symptoms of poisoning; it was followed by extensive ecchymosis up to the thigh, swelling and suppuration of the glands of the groin and axillæ, and great general constitutional disturbance; and the wound was five months in healing, after forming several deep-seated abscesses and sloughing extensively. Several flat-tailed sea snakes of a dingy grey colour, called Maroke, were within the weir; the natives say they are very poisonous, which I have reason to believe, but they refused to let me kill one, saying it would bring *cheloka*, or ill-luck, to their fishing; they were gently raised in the hand-net and put outside the enclosure. A small alligator was hotly chased, but he broke through the weir and escaped to sea. Great numbers of fish were rejected, among them two species of *Syngnathus*, one very large, and all the *Chatodon* tribe, some very curious and beautiful; but I had with me no means of preserving them. The natives believe them all to be poisonous; a vast number of shrimps, prawns, squillæ, and other crustacea were also rejected, not, as the people said, because they were not good, but because they had plenty of fish without them. An ichthyologist who did not mind roughing it a little, and who would follow these people for a week, would reap a rich harvest indeed. I was told that the weir was the common property of the tribe, but that every man fished in it on his own account. When the mud was quite dry, or as nearly so as it could be, countless multitudes of small crabs, of five or

six species, made their appearance, and were in constant motion, raking over the semi-liquid mud with their claws and feet, and every now and then raising themselves on four feet above the surface, and spreading their extended chelæ in the air. I got two or three specimens of a little varnished black *Mitra*, crawling on the mud, but no other shells, except the *Arca* before mentioned. It rained heavily all the afternoon, and when during the night the tide rose and floated us, we had a strong head wind; so we were obliged to remain where we were until morning, only going out into deeper water.

26th. Got under weigh this morning at five A.M., with a fine fair wind, and stood across the northern part of Amphitrite Bay, as it is called on the charts. The shore is still all of the same character, but we were not so near it. I saw many wide gaps in the line of trees, being the mouths of considerable rivers or creeks, all named correctly and with minuteness on the Dutch charts; in spite of all this correctness, there is a small but very conspicuous island off a point named Jangong Kangka, which is not laid down at all. It is a mere mud bank, covered with Api Api trees, and is called Pulo Barang, or Mud Island; and I am inclined to look upon it as a proof, if indeed one were needed, of the extremely rapid growth of the land on this coast. The survey is some fifteen or sixteen years old, and the island must have been all day long, for weeks, before the eyes of all employed, had it existed at that time; it is besides visible from so many points, and is so well adapted for a station, that I think it could not possibly have escaped any surveyor. In favour of this opinion, I may add that the trees, though tolerably large, are all young and vigorous, and there are none of the decayed worm-eaten stumps generally seen in such situations. We entered the mouth of the Indragiri about twelve o'clock; there was a very disagreeable cross sea, caused by the meeting of the tide with the fresh-water current, at this season very strong; and I observed, as I have frequently done in several similar places, a phenomenon which, so far as I am aware, is undescribed. This is a dull droning musical sound appearing to come from beneath the boat; it varies about three notes, E, F, G, of the bass clef, which run into one another as in a badly tuned Æolian harp, and is in tone something between the bassoon stop of an organ and the drone of a bagpipe; sometimes it resembles also the creaking of an ill-shutting door, and leaves an unpleasant vibratory sensation on the ear. The natives call it "swara hams," voice of the current, and

attribute it to the mixing of the fresh and salt water. I have certainly heard it in several places at the mouths of rivers, where this mixture must have been going on, and in such places only. I think it is a little louder at night than in the day. We entered the northern mouth of the Indragiri, now called Kwala Loukko; this I knew very well from my chart, and supposed the steersman knew it also, as he came in without saying a word. It appears, however, that he had never been in this way before, and had not intended it, but had made a mistake; on discovering this, he wished to turn back and go up the main channel, which would have lost us one or two days, and it cost me some trouble to convince him that we could go where we were. The stream was at the mouth about a mile and a half wide, the banks fringed with Nipa and Padada (*Sonneratia acida*); the latter always a sure sign that the water is nearly fresh, as on trial I found it to be. I could also distinguish, by its habit, the tall *Rhizophora* named Tumino; but until it was dark in the evening we did not approach the shore near enough to see much of the vegetation. At six P.M. we made fast for the night to a tree at the mouth of a small creek; and a most unlucky locality we chose, for until about eight P.M. the mosquitoes drove us half mad: they are always troublesome enough, but those on the Nipa swamps are always excessively venomous, every bite raising a large white wheal. At nine P.M. came on a violent squall with torrents of rain; but we covered up the boat with Kajang or palm-leaf mats, and went to sleep, in hopes of weathering the storm comfortably: so we remained until past midnight; and when all (including, I am afraid, the watch) were asleep, a huge tree came down with the current, and, striking us with such a shock that I believed at first the boat must be utterly destroyed, tore us from our moorings, swept away all our shelter, and swept us down the stream with it. It was raining as it rains only in the tropics, blowing great guns, and thundering and lightening fearfully, so that we were all drenched in a moment. We were in a most dangerous position, for we were quite fast in the branches of the drift, and had it rolled over, the boat must have gone down; however, we got clear of it at last, after half an hour's hard work cutting away with choppers in the dark. The stream was now so strong in the middle of the river that our anchor would not hold; and as we did not know whether it was flood or ebb at this hour, we were obliged to try to light a torch to see the compass: in this we succeeded after several trials, and found

we had been carried nearly out to sea again, so we got as quickly as we could to the bank, and made fast to the Nipa-leaves until daylight.

On the 27th, at five A.M., it was still raining a little; but while the men were cooking their rice, I went ashore among the Nipa, and got a few shells,—two species of *Neritina* and a *Cerithium* creeping on the mud, a pretty little pink *Anomia* on the stems of the Nipa, and a *Bulinus* and a *Pholas*, the two latter apparently peculiar to the Nipa; the latter forms its burrows in the soft pithy substance of the thick bases of the growing leaves. It is far from pleasant to explore a Nipa swamp: independently of the difficulty of getting along in the soft black mud, you are always half devoured by mosquitoes of the most venomous kind. Just as we started, a great blue heron perched on a stump near us; I put a rifle bullet through his neck, and he greatly improved our dinner, after several days of rice and salt-fish curry. Though neglected in these days in England, I have always found all the heron tribe excellent food. My servant took off all the meat from the breast and thighs, and, as he said, made beefsteaks of it; it was quite tender, and had in some degree the flavour of woodcock. We pulled and sailed all day up the river, passing the head of the Delta about noon, and seeing until three P.M. hardly any vegetation except Nipa and *Sonneratia acida*, with here and there a *Rhizophora*, or a tuft of the Fern called *Peai* (I believe, *Acrostichum inaequale*). The *Sonneratia* is a most beautiful tree, with very long slender pendulous branches; the flowers are handsome, the long stamens being of a rich dark pink, but they fall an hour or two after sunrise; the fruit is very conspicuous, with its great persistent star-shaped calyx; it is acid and slightly bitter, and is eaten by the natives as a condiment with their rice and salt fish. The creeping rhizomata of the Nipa look very strange when exposed by the washing away of the mud: each internode is very short, but in order to give room for the attachment of the enormous base of the leaf, it is applied so obliquely upon the last, that the whole resembles a number of discs laid in a row, and slightly overlapping each other; the upper side of these discs, a foot or eighteen inches in diameter, retains the scars left by the disarticulation of the leaves, and the lower produces a tangled mass of simple fibres, about half an inch in diameter. The way in which these fibres run into the mud has often forcibly reminded me of the carbonized traces of the fibres of *Stigmariæ* in the underlay of the coals of Europe (here we have nothing of the sort). On the stems of the *Sonneratia* I saw

a very handsome ivory-white foliaceous lichen, without fruit ; there was a little pendulous *Appendicula*, with thick equitant leaves and minute axillary purple flowers ; and another curious little plant of the Orchis-family, remarkable in having no leaves or stem—it consists merely of a few radiating fleshy fibres adhering to the tree ; from the centre rise two or three spikes, bearing a few minute yellowish-green flowers. I have since seen it in abundance in Java, and especially in the island of Banku, where the trunks of *Pleurocarpus Indicus*, planted about the town of Minto, were completely covered by it. A small Fern, I think *Acrostichum nummulariaefolium*, creeps over the trees to the very extremities of the twigs. About three P.M. we arrived at a small island in the river, where the salt-water flood appears to cease almost at once. The Nipa disappears as a social plant, a few scattered tufts only being seen ; and some stunted patches of the Moong, always a freshwater Palm, begin to rise here and there above the jungle. The island takes its name, Pulo Pullas, from the abundance of a beautiful little scarlet-fruited *Licuala*, so called. From this change in the vegetation, as well as from the presence of the island and a sand-bank, which reduces the depth to a fathom and a half, it is probable that at this point the freshwater stream and the flood tide exactly neutralize each other ; and indeed above this, though the stream became less rapid, and its level rose on the flood-tide, we had no more current up the river. I saw today the first indications of elephants, or at least of some very large animal, coming to the river to drink. Our wooden anchor would not hold tonight in the soft mud, so we were obliged to make fast to a tree, though the men professed to be horribly afraid tigers would leap into the boat. We had another alarm tonight, for, being close to the bank, the rising tide jammed us under an overhanging tree ; but the night was fine, and we soon got all clear, just as the old steersman saluted the dawn with a most dreary noise, by blowing into a bamboo, which he called twong-twong.

28th. Off again at five A.M. The Nipa has quite disappeared, and the Padada is much less common, and not so well grown as lower down. Another social plant, the *Rangas*, of the Order *Anacardiaceæ*, seems to take its place ; it is a bushy shrub or small tree, growing quite in the water ; the leaves are of a bright clear green, when young very red, and it was now covered with fruit, about the size of an egg ; the cotyledons very large and covered with a thick corky bark. Two other

trees have received this same name of *Rangas*: one is an enormous tree, growing also by the rivers, but quite in the interior; the other is also a large tree, of which I have seen neither fruit nor flower. It yields a red and dark brown veined wood, largely used for common furniture at Singapore. The bark of all three, and indeed of several other trees of the tribe, yields copiously a limpid juice, changing rapidly to a black varnish. This juice is exceedingly venomous, blistering the skin severely, and leaving foul little ulcers very difficult to heal. The trees are now beginning to be clothed with parasitical Ferns; there are also a few small *Orchideæ*, chiefly *Dendrobia* and *Appendiculæ*, and abundance of the ubiquitous *Dendrobium crumenatum*. The current came down so strong about nine A.M., that we were obliged to anchor. I saw now the first alligators; one enormous fellow I fired at, and, I suppose, hit, for he threw his huge body quite out of the water with a tremendous splash. The natives say an alligator never recovers from a wound, however small; he has nothing to scratch himself with, his feet being too short; and they say that the flies in the air, and the small fish in the water, never leave him a moment's peace: so that the wound becomes larger and larger. I have indeed seen an alligator which I shot through the leg, taken two or three days afterwards, with almost the whole shoulder sloughed away, so that the story may be true. The quantity of monkeys seen here is wonderful. I only know the names of two, *Nasalis larvatus*, a horribly ugly animal, and *Hylobates concolor*, frequently trained by the Malays to gather fruit; but there are many other species:—the Moniet; the Sipai, a beautiful little black fellow with white stockings and long gloves; the Lotong, a frightful animal, with a scowling face and grizzled black hair; the Wa Wa, or long-armed ape; the Orang Hutan (this is the proper spelling: it is literally "man of the woods"); the Ungku, which fills the whole country in the early morning with a most frightful howling, the most unearthly noise I have ever heard. We passed to day many clear spaces covered with long grass, species of *Anthistiria* and *Saccharum*; these are the favourite feeding grounds of the elephants. The seed of the *Anthistiria* contains a good deal of farina, and must be very nutritious. These places, I was told, were formerly settlements, driven away by the tyranny of the Rajahs. Met a prahu today going to Singapore with gutta-percha; but all of second-rate quality. The Nakoda told me I should not reach the Rajah's village for three days more. I took the opportunity of send-

ing some letters to Singapore. The fire-flies tonight are most magnificent, the whole jungle was lighted up by them: the light is not steady, but is brighter at intervals of about two seconds; and I have often remarked, that all the individuals on the same tree or branch are subject to this augmentation of light at the same moment. It has just the effect of some electrical toy, showing the intended word of outline at the moment the spark passes.

29th. We pulled last night some distance in the dark. The jungle has very much changed its appearance; it has a much more *interior* look. Patches of grass come down here and there to the bank; the trees are larger and more varied in appearance, and there are many *Scitamineæ* to be seen in the shade. There are also many *Rotans*; one species, in particular, is most elegant, it is called Rotan Tikus, "*Mouse Rattan*;" it has a glaucous pinnate leaf, with wedge-shaped premorse leaflets and inflated thorny sheaths. At half-past six A.M. passed a river on the left; it is named Chenaku. At this spot the river makes a sudden turn to the north-east; its general direction has hitherto been west. The calm clear beauty of this morning, as the sun rose, was indescribable. We have now quite lost the Rangas and Padada; the banks are chiefly fringed with *Paritium tiliaceum*, covered with its magnificent yellow blossoms, which, however, are beautiful only in the morning; a few hours' sun changes them to a dirty brick-red. Mixed with this were a slender *Saccharum*, and two species of *Phyllanthus*, etc. etc.; and all was matted together by a ternate-leaved *Cissus*, with large black fruit like grapes, and a beautiful purple *Ipomœa*. But the pride of all the vegetation here is the happily named *Lagerstroemia regina*: it is a magnificent tree, growing to a large size, and was now completely covered with lilac blossoms in spikes ten to eighteen inches long, and in such abundance, that the woods were quite illuminated by it. Imagine *Lythrum Salicaria* multiplied in size ten times, and grown to a large tree, it will give you some idea of this plant. Its wood is very valuable, being hard, tough, and almost indestructible; it is called here Kamnu-ching, but elsewhere Boongoor. We passed an enormous Reed-bed; it seemed to be composed of two species of *Saccharum* and one *Arundo*; it was matted together by several *Convolvulaceæ* and a Cucurbitaceous plant like a *Luffa*. The long floating runners of the Grasses, all fringed with trailing *Confervæ*, shot far into the stream; and between the stems of the grass, in still places, where the current could not reach them, were little

colonies of *Pistia stratiotes*, and a beautiful minute *Azolla*. Thousands of small black swallows, with chestnut-brown throats, were skimming about, or swinging in the wind, perched upon the feathery waving tops of the Reeds; snow-white herons gravely stalking over the floating grass; and a flock of busy little finches clinging and searching about the dry panicles, made it a lively and beautiful scene. The river was a good deal swollen today, bringing down much drift; and the current was very strong, so that we made little progress.

About two o'clock reached the first settlement on the river, called Pulan Iumhaat. The clearings are not more than 200 to 300 yards wide, skirting the river for two or three miles; the stream is divided by an island, hardly above the now high water, but covered with Padi, and the black species of *Coix*, called by the natives "Salli batu;" and here and there small patches of *Sorghum*; the whole interspersed with numerous Anan-trees, *Saguerus saccharifer*. I stopped the boat near this place to get some curious pendulous birds' nests, of which there was a large colony on some low trees. The bird is a little finch or bunting; the nests are about two feet long, in shape like a Florence oil-flask; in the bottom is a hollow, as in an ordinary wine-bottle, across which is a little perch, on which the natives assure me the male bird roosts while the female sits on the eggs, which are deposited in hollows excavated in the upper part, which is at first built solid. The whole fabric is of fine grass, beautifully woven together, and is fastened very finely to the branch by a band of grass passing round it; it swings, however, quite freely in the wind. I got here some specimens of a curious black spiny *Neritina*, from the long floating runners of the Reeds. We also got some unpleasant fellow-passengers, in the shape of a flight of large greenish-brown Gad-flies, whose bite was very painful. A large Aroid leaf, probably a *Caladium*, was here very abundant and ornamental; I saw no flowers. About four o'clock stopped at a small house in a Padi patch, at the mouth of a brook; the family consisted of an old man, two women, and several children, and certainly they were packed into the smallest possible room. There were two young men sitting in the house, whom, from their affectation of contempt, I knew at once to be Rajahs: they were, it appeared, the sons of a petty chief up the river, very oppressive and much disliked. There are many of these petty chiefs in the country, and they are a great curse to the people. They are not generally oppressed by their absolute rulers;

their tribute is taken from them, it is true, in an irregular and irritating way, but they probably pay not half as large a proportion of taxes as we do in England; but every man who has a little royal blood in his veins, thinks he has also a right in some particular district also to collect the same tribute for his own use and benefit; and it not unfrequently happens, that the poor people, who dare not complain, pay two or three times over. The old man told us much of his greivances when his aristocratic visitors had taken leave. He then showed us his plantation: he had plenty of rice, ginger, turmeric, and remarkably large and fine capsicums; and he gave us some cucumbers, sugar-canes, and a kind of Plantain called Pisang Nipa, from the closely packed fruit bearing a distant resemblance to that of the Nipa: it was a good and sweet kind. They had here the largest domestic cats I have ever seen, of a dun colour, with light blue eyes, and very full in the cheeks, they had the twisted tail of all the Malay cats.

On SPHRAGIDIA and ECCREMANTHUS, two new Genera of Ceylon plants; together with Observations on the Genus HEMICYCLIA, W. et A.; by G. H. K. THWAITES, Esq., F.L.S., Superintendent of the Royal Gardens, Peradenia, Ceylon.

(With two Plates, IX. and X.)

Nov. Gen. I. SPHRAGIDIA, *Thw.* Nat. Ord. EUPHORBIACEÆ.

Tribus *Buxæ.*

Gen. Char. Flores dioici. Calyx 4-5-partitus, imbricatus, segmentis subæqualibus, concavis; 2 externis. Corolla nulla.—Fl. MASC. Stamina numerosa, disco plano extus inserta; filamentis linearibus; antheris oblongis, introrsis, dorso affixis, longitudinaliter dehiscentibus, loculis basi paullo divergentibus. Ovarii rudimentum minutum, didymum.—Fl. FÆM. Stamina nulla. Ovarium liberum, subquadratum, basi disco patellæformi cinctum, biloculare, loculis 2-ovulatis. Ovula collateralia, sub placentæ processu magno pendula anatropa. Stylus subnullus. Stigmata 2, plana, discoidea, transverse oblonga. Fructus subcarnosus, indehiscens, bilocularis, putamine crustaceo, loculis monospermis. Semina orbiculari-compressa, exarillata, pendula. Embryo orthotropus; radícula brevi, crassa; cotyledonibus planis, foliaceis, albuminis carnosî peripheriæ attingentibus.—Arbor

mediocris, Zeylanica; ramulis teretibus; foliis integris, lanceolatis, penniveniis, petiolatis, basi angustatis; stipulis parvis, erectis, lanceolatis, deciduis; floribus fasciculatis, axillaribus.

Sphragidia Zeylanica, Thw. (TAB. X.)—C.P. No. 2424 in Herbario Peradeniensi.

A compact tree, 30–40 feet in height, with rugose bark. The young ramuli and principal veins of the young leaves covered with a deciduous brown tomentum. Leaves of a dull green, 5–10 inches long, by $1\frac{1}{2}$ –3 inches wide. Petiole 4–8 lin. long. Flowers yellowish, externally and the pedicels covered with a brown silky tomentum. Ovary brown, strigose.

HAB. Occurring sparingly in the Central Province at Hunasgiriya and Allagalla, at an elevation of about 3000 feet. Wood very hard.

PLATE X. Fig. 1. Female flowering branch of *Sphragidia Zeylanica*. 2. Female flowers. 3. Longitudinal section of ovary. 4. Transverse section of ovary. 5. Ovules surmounted by the placental process. 6. Male flowers. 7. Stamens. 8. Ripe fruit. 9. Longitudinal section of fruit. 10. A seed, with the abortive one attached. 11. Section of seed, showing the embryo:—*magnified*.

Genus HEMICYCLIA, W. et A., Edin. New. Phil. Journ. xiv. 297.

—*Astylis*, R. W. Icon. tab. 1992.

Gen. Char. emend. Flores dioici. Calyx 4-partitus, imbricatus, segmentis subæqualibus; 2 externis. Corolla nulla.—FL. MAS. Stamina indefinita, plus minus numerosa, discum planum vel excavatum cingentia; filamentis linearibus; antheris adnatis, oblongis, longitudinaliter dehiscentibus; loculis lateralibus vel subextrorsis. Ovarii rudimentum nullum vel minutum.—FL. FEM. Stamina nulla. Ovarium oblongum, liberum, basi disco annulari cinctum, uno latere sæpe gibbum, 1-loculare, 2-ovulatum. Ovula collateralia, anatropa, subplacentæ processu magno pendula. Stylus subnullus. Stigma magnum, dilatatum, unilaterale. Drupa carnosa, putamine osseo, monosperma. Semen pendulum, exarillatum; testa membranacea, colorata. Embryo in axi albuminis carnosus; radícula parva, cylindrica; cotyledonibus planis, foliaceis, orbiculatis.—Arbores mediocres Indicæ et Zeylanicæ; foliis simplicibus, alternis, petiolatis, subcoriaceis; stipulis minutis, deciduis; floribus fasciculatis, axillaribus.

This genus, with which *Astylis* of Dr. Wight is evidently congeneric,

is very closely allied to *Sphragidia*, differing principally in the ovarium being unilocular. The learned authors of this genus must have had very imperfect specimens to describe from, or the fruit of some other plant must have been mixed with their specimens of *Hemicyclia sepiaria*, when they state the ovary to be two-celled, and each cell to have a solitary ovule; for in the great number of flowers of this species which I have examined, I have invariably found a one-celled ovary with two contained pendulous ovules. On this account I have thought it desirable to draw up the above amended characters of the genus.

Through *Sphragidia* and *Hemicyclia*, the *Buxæ* tribe of the *Euphorbiaceæ* approach so near to the *Antidesmeæ* (amongst which Dr. Wight has included *Astylis*), that there seems scarcely sufficient grounds for retaining the latter as a separate Order. *Pyrenacantha*, Hook., now associated with the *Antidesmeæ*, will no doubt, however, have to be removed elsewhere, on account of its twining habit, exstipulate leaves, peculiar albumen (a modification, apparently, of ruminated albumen), and ovules with the raphe turned away from the placenta.

1. *Hemicyclia sepiaria*, W. et A.—Edin. New. Phil. Journ. xiv. 297.
—R. W. Icones, tab. 1872.—C. P. No. 2120 in Herbario Peradeniensi.

Arbor mediocris, foliis glabris, oblongis vel obovatis, retusis, margine subdentatis vel undulatis, $1\frac{3}{4}$ – $3\frac{1}{2}$ poll. longis, 1–2 poll. latis; *floribus* numerosis, minutis, albidis, 2 lin. latis. FL. MASC. *staminibus* 8–11, discum planum cingentibus; *ovarii* rudimento nullo. FL. FÆM. *stigmatæ* concavo, crenato. *Drupa* subsphærica, rubra.

HAB. Abundant in the warmer parts of the Island, especially towards the north. It is called by the Cinghalese "*Weera-gass*."

2. *Hemicyclia Gardneri*, Thw.—C.P. No. 2121 in Herbario Peradeniensi.

Arbor mediocris, foliis lanceolatis, crenatis, retusis, minutissime mucronulatis, versus petiolum pubescentem angustatis, subtus prope basin pilis longis stipatis, costa pubescenti; *floribus* paucis, flavescentibus, 6 lin. latis. MASC. *staminibus* circiter 24, discum medio excavatum cingentibus, *ovarii* rudimento nullo. FÆM. *stylo* brevi; *stigmatæ* convexo, carnosio. *Drupa* oblonga.

HAB. Found in the same situations as the last, but not so abundant. The much larger flowers, and the different shape of the leaves and fruit, well distinguish it.

NOTE. The *Astylis venusta*, R. W., found by Dr. Wight on the western slopes of the Neilgherries, has not yet been met with in this Island. It may be characterized as follows:—

3. *Hemicyclia venusta*.—*Astylis venusta*, R. W., Icones, tab. 1992.

Arbor mediocris, foliis glabris, lanceolatis, acuminatis, basi angustatis, 5–7 poll. longis, $1\frac{1}{4}$ – $1\frac{3}{4}$ lin. latis; *floribus* 6 lin. latis. MASC. *staminibus* 5–8, discum planum cingentibus; *ovarîi* rudimento minuto vel nullo.

Nov. Gen. II. ECCREMANTHUS, Thw. Nat. Ord. SAPINDACEÆ.

Char. Gen. Flores polygami. *Calyx* 5-partitus, æqualis. *Corolla* petala 5, calycis laciniis alterna, esquamulata. *Discus* annularis calycis fundum occupans, regularis. *Stamina* 5, petalis alterna, disco intus inserta, æqualia; *filamentis* filiformibus, in floribus fertilibus brevioribus; *antheris* rotundatis, bilocularibus, rima dorsali insertis, longitudinaliter dehiscentibus, versatilibus. *Ovarium* centrale, substipitatum, obcordato-bilobum, biloculare. * *Ovula* in loculis solitaria, e basi erecta. *Stylus* inter lobos simplex. *Stigma* bilobum. *Fructus* indehiscens, unilobus (lobo altero effæto, minuto), monospermus; vel rarius bilobus, dispersus. *Semina* oblonga, erecta, singula arillo carnoso inclusa; *testa* coriacea. *Embryonis* exalbuminosi *cotyledones* crassæ, incumbentes; *radicula* cylindrica, versus hilum directa. —*Arbor ingens Zeylanica*; foliis alternis, exstipulatis, abrupte pinnatis, 5–13-jugis; foliolis oppositis, penniveniis, dentatis; floribus plurimis, minutis, in ramis paniculi pendulis elongatis cylindricis dense aggregatis.

1. *Eccremanthus eximius*, Thw. (TAB. IX.)—C.P. No. 1153 in Herbario Peradeniensi.

A fine forest-tree, conspicuous from its very large, abruptly pinnate leaves, which frequently measure more than 3 feet in length, and have from five to thirteen pairs of opposite, lanceolate, nearly sessile leaflets, each full-sized leaflet measuring a foot or rather more in length, and $3\frac{1}{2}$ inches in width. The few pairs of leaflets towards the base of the leaf are gradually smaller, and there is a very small, oblique, deciduous pair seated on the upper part of the tumid base of the petiole, and which, without a close inspection, might be taken for stipules. Primary veins of the leaflets straight, every alternate one terminating in a small tooth on the margin of the leaflet, the others curved forward be-

fore reaching the margin. Young ramuli, and the pétioles and veins of the reddish-brown young leaves covered with a brown, deciduous tomentum. Flowers very minute, scarcely a line in width; petals white, annular disc bright red. Each fruit-lobe oblong, $1\frac{1}{4}$ inch long and $\frac{3}{4}$ inch wide, deep red, enclosing a single red-brown seed, enveloped in a white, semitransparent, fleshy aril.

It will be seen by the above character that this handsome species is closely allied to *Nephelium*; it differs however from the species of that genus in having only five stamens, which are alternate with the petals; as well as in the form of the embryo. The habit of the plant, too, is very distinct. It occurs not uncommonly in the Central Province, at an elevation of from 1000 to 2000 feet.

PLATE IX. Fig. 1. Portion of flowering branch of *Eccremanthus eximius*, Thw. 2. Small portion of panicle, *slightly magnified*. 3. Barren flower. 4. Stamens. 5. Fertile flower. 6. Longitudinal section of same. 7. Ripe fruit. 8. Seed enclosed in arillus. 9. Seed. 10. Section of embryo.

Note on Pteridophyllum decipiens, Thw. (Rhus decipiens, W. et A.)
—In describing this species, in Vol. VI. page 65 of the present work, I referred it, as had been previously done by the talented authors of the Prodromus Fl. Pen. Ind. Orient., to the Natural Order *Anacardiaceæ* or *Terebinthaceæ*: it would seem however, taking into consideration certain points in its structure, such as its bilocular ovary and the circumstance of its stamens being seated quite within the disc, to be more correct to arrange it with the *Sapindaceæ*.

Botanical Objects communicated to the KEW MUSEUM, from the AMAZON or its Tributaries, in 1853; by RICHARD SPRUCE, ESQ.

(Continued from p. 252.)

173. Four *Juruparís* (or Devils), used by the Indians on the Uaupés in their *dabocurís* (festas). These are musical instruments. The two larger are portions of the trunks of the Paxiuba Palm (*Iriartea exorrhiza*), with a square hole near the upper extremity. When about to be used, this end is nearly closed by a piece of clay, and a piece of Uaruma leaf tied on above the square hole, so as to form a monster flageolet. The smaller ones consist of a tube of Paxiuba, wrapped with a long

strip of the tough bark of *Jébarú* (a Cæsalpineous tree, with handsome red monopetalous flowers, apparently the *Parivoa grandiflora* of Aublet), which descends in widening folds to some distance below the tube; thus forming a sort of trumpet, which is simply blown into at the upper end. I cannot find that the Juruparís are objects of actual adoration, but they certainly are of fear and respect. No woman is ever permitted to see them, and should such a circumstance occur, the woman is certainly put to death, generally by poison, though the sight should have been accidental on her part. Youths are not permitted to handle or blow the Juruparís before the age of puberty, and must previously have undergone a series of fastings and scourgings. The Juruparís are kept hidden in the bed of some stream deep in the forest, in which no one dares to drink or bathe; and they are brought out only by night, and blown outside the house where the feast is held, in order that no woman may obtain a sight of them.

174. Three shirts of *Tururí*, called *Tácaé* by the Cubéu Indians on the Rio Uaupés, who use them in their funeral feasts, when they drink the ashes of the bones of their deceased relatives. There are two sorts of *Tururí*; the common red, which is the bark of a large Artocarpeous tree, allied to *Antiaris*, frequent on Rio Negro and Casiquiare, and of which I procured specimens at São Gabriel: it is used for bags, for caulking canoes, and on the Guaima and Casiquiare (where it is called *Marimá*) a rude kind of shirt is made of it. The *Tururi-morotinga*, or white *Tururí*, of which the bodies of the *Tácaé* are made, is the bark of a real Fig, a low terrestrial species, which I could not distinguish by the leaves from a species I had gathered near São Gabriel. The arms of the shirts are of red *Tururí*; the fringes of *Sapucaya Castanha* (a name applied to all the large-fruited *Lecythides*). The colours used in painting them are carajurú or anatto for red, and soot for black.

175. *Guayúcu* of stout cotton cloth, woven by the Piaroa Indians on the Orinoco, and worn by them and the Maquiritares. It is 5 or 6 feet long by about 20 inches wide, and has a tassel at each corner. It is worn between the thighs, secured by a string passing round the loins, and the free portion either hangs down behind, or is passed up the back and over the left shoulder.

176. Two baskets of strips of rind of various species of *Maranta*, made by Maquiritare Indians on the Rio Cunucunuma, and used by them for holding their tinder-box, fish-hooks, arrow-heads, etc.

177. Apparatus for making and taking Niopo snuff, procured from Guahibo Indians, at the cataracts of Maypures. The *Niopo* of Venezuela is the same as the *Paricá* of Brazil, and is used on the upper Orinoco, Guaviare, Vichada, Meta, Sipapo, etc. There is no doubt of its being prepared from the *Acacia Niopo*, Humb., which is perhaps not different from *Piptadenia peregrina*, Benth. My specimens of the Paricá-tree from the Barra are referred to the latter species by Mr. Bentham. I did not see the tree from which the Guahibos obtained their Niopo, and which they told me was planted in their cunucos near the head-waters of the River Tupáro; but the Paricá I have seen on the Amazon and all the way up the Rio Negro planted near the villages, belongs to but one species, which, on passing the Venezuelan frontier, takes the name of Niopo.

In preparing the snuff, the roasted seeds of the Niopo are placed in a shallow wooden platter, which is held on the knees by means of a broad handle grasped in the left hand; then crushed by a small pestle of the hard wood of the Palo de Arco (*Tecomæ* sp.), which is held between the fingers and thumb of the right hand.

The snuff is kept in a "mull" made of a tiger's bone, closed at one end with pitch, and at the other stopped with a cork of Marima. It hangs from the neck, and has attached to it the tuberiferous rhizomes of some *Cyperacea* (? *Hypoporum nutans*, Nees), which are slightly odoriferous. These, or the tubers of some allied species, are used throughout the Amazon, Rio Negro, Uaupés, etc., among Indians of the forest. With a piece of Piripiríoca (the name given to them in Lingoa Geral) about the person, one is safe from the bad wish and evil eye.

The instrument for taking the snuff is made of birds' bones, and differs somewhat from that used by the Catauixi Indians (see Journ. vol. v. p. 246). Two tubes end upwards in little black balls (the endocarp of some species of *Astrocaryum*), which are applied to the nostrils, while the single tube on which they unite at the lower end is dipped into the mull, and thus the Niopo is snuffed up the nose.

I enclose a piece of Caápi, from which the Indian, who was grinding Niopo, every now and then tore a strip with his teeth, and chewed with evident satisfaction. It had been slightly toasted over the fire. "With a chew of Caápi, and a pinch of Niopo," said he to me, in imperfect Spanish, "one feels so good—no hunger—no thirst—no tired!" A

piece of Caápi is generally suspended along with the snuff-box, but the snuff-tube is stuck in the thick bushy hair of the head.

178. Portion of the *stem of the Caápi*, given me by a Guahibo Indian at Maypures. The Caápi is a Malpighiaceae twiner (*Banisteria Caapi*, MSS.), planted by the Indians of the Uaupés, Guaviare, Meta, etc., for the sake of chewing the stem or drinking its infusion. (See Catal. No. 166.)

179. *Sack of fibre* called *Iteniquen*, extracted from the leaves of the *Cociusa* (*Bromeliaceae*, an *Agavis* sp.?). Used for bringing coarse rock-salt from New Granada, by way of the Apure, to the Orinoco and San Fernando de Atabapo.

180. *Stems of a Menispermous twiner* (3567 to Benth.). San Carlos. October, 1854. Cutting through the stem does not destroy the existence of the upper part, which speedily re-establishes a communication with the soil, by means of radicles sent down from its joints.

181. Fruit of a Palm, called by the Barré Indians *Téco* (a stemless species of *Attalea*), frequent on the Rio Negro, near its confluence with the Casiquiare. Seeds edible, resembling those of the Cocoa.

182. Uppermost frond of *Mauritia aculeata*, Humb. (non Martii) = *M. gracilis*, Wallace. Frequent on the Guaimá, Atabapo, and other rivers of black water. It is called *Uliya* by the Barré Indians.

183. *Quivers* containing *poisoned arrows* for the *Cerbatana* (*Gravatana*, Portug.), made by Cunipusana Indians, at the head-waters of the Rio Pacimoni. They seem to be formed of the pinnæ of some species of *Attalea*. The arrows are of the beard of the Pataúá Palm. (When I came to look at these quivers, some days after leaving the Cunipusana Indians, I found a piece of rag, sewed up into a ball, stuck within each. My Indians told me that the women had put them in as a charm, in order to bring me to revisit their country at some future day. They had also tied a fragment of some odoriferous root in each of the four corners of my hammock.)

184. *Taparitos* (*small Gourds*) of *Curári* (the Uirári, or "bird-poison," of Brazil). Made by the Indians of the River Pacimoni, from the bark of two downy-leaved species of *Strychnos*. I fear the poison will be quite dried up by the time it reaches you. The Indians keep it in a cool, moist place, and, if it becomes stiff, set the taparitos for some time on the moist ground, or boil the Curari over again.

185. *Gum-resin* called *Caranha*, extracted from some species of *Icica*,

by Maquiritare and Piaroa Indians, on the Orinoco. Applied in plasters to the chest, etc., as Burgundy pitch in Europe.

186. *Peramán*, a sort of pitch, prepared by Piaroa Indians on Orinoco. Apparently identical with *Oananí* of Brazil, and certainly extracted from a species of *Moronobea*, which, from its leaves, I cannot distinguish from *M. coccinea*. At San Carlos it is called *Máni*.

187. *Bark of Jatuá-úba*, a small tree on the banks of the Rio Negro, especially in the lower part. A powerful emetic, which has great reputation in cases of ague. It was given to me in a sitio at the mouth of the Xibará. The tree is still unknown to me.

188. *Oil-bottle* used by the Maquiritaires, on the Rio Cunucunúma. It is merely a gourd, cased in a basket-work of Uarumá, and had contained Bacaba oil.

189. *Mandiocca-graters*, made on the Rio Içanna, which enters the Rio Negro from the east, a little way above the mouth of the Uaupés. Made of the soft but tenacious wood of an Apocynous tree (2265 to Benth.). The stones are chiefly a bluish, fine-grained granite, from the Içanna, broken into fragments of convenient size. Design scratched with point of a large nail; then with the same a hole is pricked for the insertion of each stone, and a blow of the nail-head secures it in its place. The grater thus formed is anointed with milk of *Cumá* (*Couma dulcis*, Benth., and other Apocynous trees, probably of the same genus), which is a powerful adhesive, not affected by juice of Mandioca or other moisture. I have seen graters which were decayed and almost worn through at back, while not a tooth had fallen out. Içanna graters are in great request throughout the Rio Negro and Amazon, and even on the Orinoco.

190. Wooden instrument, shaped rather like a hatchet, hung over the left shoulder by Uaupés Indians in their dances; whether it has any other use I cannot say.

191. Petioles of the Piassaba Palm (*Leopoldinia Piassaba*, Wallace), showing the mode of growth of the "beard," which is quite analogous to the matted sheath of the fronds of the common Cocoa, the beard of the Patauá, etc. The "Piassaba" used for making ropes, etc., is taken from young trees only, of from three to five feet high; for as the trunk grows higher, the beard of each frond grows gradually shorter, so as to be unserviceable for such purposes. I enclose the long beard taken from a tree four feet high, and others from a tree of forty feet. Forests on the Guainia and Casiquiare. November, 1854.

192. *Hat* of the leaves of the *Berá*, or Arrow-grass (*Gynerium saccharoides*). Made at the Pueblo de Monagas, near the upper mouth of the Casiquiare. The rough cuticle is scraped off the leaves, and they are then split up into strips of convenient breadth. These hats are of very ugly form, but for flexibility and durability they can hardly be surpassed. I have seen them nowhere but on the Guainia and Casiquiare, though the material exists in endless abundance on the Amazon.

193. Two sheets of *Maríma blanca*, the bark of an epiphytal *Ficoidea*, found on the upper Casiquiare. The Indians on the Casiquiare and upper Orinoco make themselves smocks of this, to preserve their bodies from the bites of mosquitos. It corresponds to the *Tururí* of Brazil.

194. Shallow circular *basket*, made by Maquiritare Indians on the Rio Cunucunúma, of slips of some Bamboo which has very long internodes (perhaps the same species as they use for the inner tubes of their blowing-canes).

195. Three gallons of *Oil of Sassafras* (in a demijohn). Extracted on the rivers Casiquiare and Siapa, from a large *Lauraceous* tree (*Nectandra cymbarum*, Nees = *Ocotea cymbarum*, Humb.), by cutting out a large wedge (reaching to the centre), near the base of the tree, or better by boring with an auger.

(To be continued.)

Notes on the Botany of Ceylon, extracted from a letter from G. H. K.

THWAITES, Esq., Royal Botanic Gardens, Peradenia, Ceylon, May 23, 1855.

I am just returned from one of the most interesting botanical excursions I have yet made in the Island, and have brought home with me several species of plants quite new to me;—amongst them a very fine *Dendrobium*, which put my draughtsman into an ecstasy, and which is certainly very beautiful. I enclose a dried flower and leaf, and will take care you shall have a plant* of it the first opportunity that offers. I met with a curious little tree, probably a species of *Phaleria*, Jack, with subsimple branches, with opposite leaves, and with clusters of white flowers and red berries situated on the trunk: I could only find one tree of it. Another interesting plant was a bilabiate *Rubiacea*, which

* The drawing and living plant have been received at Kew.—ED.

I have not yet had time to analyze carefully, so cannot tell its immediate affinities. I found the forest where I have been exploring (between Ratuapoorra and Galle) abounding in species of *Dipterocarpeæ*:—*Dipterocarpus*, 4 species; *Doona*, 3; *Hopea*, 1; *Vatica*, 3; *Stenoporus*, 3; *Monoporandra*, 1; *Isauis*, 1; *Vateria*, 1. Most of these being new to me, have added to our number of this Natural Family very considerably. We met with a very pretty new *Mesua*, a new *Terpnophyllum*, and a *Calophyllum* I had not seen before; a new *Euphorbiaceæ*, near to, if not a species of, Dr. Wight's genus *Sarcoclinium*, with obovate-lanceolate leaves three feet long and nearly a foot wide, and racemes of small flowers, more than two feet in length, a most extraordinary-looking plant. Of *Dilleniaceæ* we met with two beautiful species of *Acrotrema*, one with finely divided chærophylloid leaves, and another with the leaves pinnatifid at the base. We also found new species of *Sapotaceæ*, *Ebenaceæ*, *Myrtaceæ*, *Memecyleæ*, *Anonaceæ*, *Gramineæ*, *Zingiberaceæ*, *Symploceæ*, *Loranthaceæ*, and other species of *Rubiaceæ*, *Euphorbiaceæ* and *Orchidaceæ*, besides those mentioned before. So you see that the Ceylon Flora is not yet exhausted; and I purpose, if nothing prevent, going next year towards the same part of the Island, keeping rather more to the westward (between Caltura and Ratuapoorra), where there appear to be some fine forests. You would have been delighted to see the lovely *Cyathea sinuata* growing in the greatest abundance: some groups of it were perfectly exquisite, and I wished them at Kew. There was a very pretty *Chirita* growing on stones in the bed of streams, like *C. Zeylanica*, but much smaller and with lanceolate narrow leaves; it is possibly a variety of *C. Zeylanica*, though at first sight very unlike it. I send you some seeds of it.

In some parts of the country where I have been recently travelling, I found the natives burning oil extracted from the seeds of the *Garcinia echinocarpa*, Thw., which is most abundant in the forests. It is a thick gummy oil, and gives out a great deal of smoke; I have a specimen of it for you, but hope to get a better one before I send to you. The natives extract oil too, for burning, from the seeds of *Mesua* and *Ko-koon*, but I have not yet been able to get specimens of these oils, though I hope to do so when the seeds are ripe. The handsome "Calamander" wood, which used to be abundant in the great Singhe-rajah forest, which I have been exploring, is now very scarce, and the remaining trees are of only moderate size, too small for felling. I succeeded

in getting specimens of the tree in fruit, but the seeds were not ripe. Another valuable timber-tree with a beautiful grain, called by the Cinghalese "Ookbairiye," and which I suspected, from having seen only a leaf, to be an *Eugenia*, I found to be a species of *Carallia*. By the way—talking of woods—I shall be in Colombo next month at the Agri-Horticultural Show, and shall then get, I trust, the collection of woods promised me for Kew last year. Our Kandy Horticultural Exhibition is to come off in July at these Gardens, but I fear it is too close upon the heels of our last show to expect much novelty about it.

I have received Dr. Hooker's kind letter, to which I hope to reply next mail, or the succeeding one after I return from Colombo. I will send in it such of my new species as will go in a letter, together with a sketch of a flower of the new *Dendrobium*.

Have you heard anything more of Mr. Burke's Plantain-fibre machine? I have suggested to the Governor here to order out a few of them for trial in these Gardens, but I do not know whether my suggestion has been acted upon.

BOTANICAL INFORMATION.

Rice Paper Plant.

Captain Mellersh, late in command of H.M. Steamer 'Ranter,' which conveyed Sir John Bowring and his suite to Siam, has just arrived from Hongkong, bringing from J. C. Bowring, Esq., noble flowering racemes of the *Aralia papyrifera*, which have flowered in high perfection in the Governor's garden at Hongkong, and the plants have attained to a great size: while in our European stoves, our plants, imported by Sir John Bowring from Formosa at the same time with his, and of the same age, have continued small and shown no disposition to flower: forcing upon us the humiliating conviction that, however high our nation may stand as successful gardeners, we have yet much to learn in regard to the skilful cultivation of tropical plants, which, speaking generally and of the larger and especially the shrubby kinds, so seldom yield flowers, and infinitely more rarely fruits.

Mr. J. C. Bowring, whose letter accompanies these flowering specimens, observes:—"The two specimens now sent, one in bud, with co-

pious bracteas, the other with the flowers fully expanded, are from the large plant at head-quarters here, which was a shoot from my original plant, but has much outgrown its parent. I was obliged to cut the latter down, to save its life; but it is now again a fine healthy plant, and I hope will flower next winter. The species has a very handsome appearance when flowering. The one above mentioned threw out twelve fine panicles of blossoms (besides two which I cut off before the flowers burst forth), more than 3 feet in length, and they crowned the shrub in beautiful style, drooping like magnificent plumes, in regular form over the large, dark, palmate leaves below. Although not a showy (gaudy) plant, there is something particularly striking about it."

Plants of Greece.

The excellent M. Theodore Heldreich, now Director of the Botanic Garden at Athens, announces a 'FLORA GRÆCA EXSICCATA,' which he prepares for sale at the price of £1. 5s. the century. A list of species published include many of the rarities of Sibthorpe, the novelties of Boissier and Heldreich and Spunner, and a collection we have ourselves received, show that the specimens are well preserved. We cannot doubt but the vegetation of so classical a country will prove interesting to botanists and to others. Persons wishing to subscribe, may address letters direct to M. Heldreich.

MR. SPRUCE'S Voyage up the Amazon and its Tributaries.

The following is the most recent information respecting Mr. Spruce, contained in a letter dated Barra do Rio Negro, March 11, 1855:—

We have news from Peru, that the two Peruvian steamers made a single voyage, one on the Ucayali, and the other on the Huallaga, and that they are now laid up at Loreto, baking in the sun, which has opened the seams, and otherwise incapacitated them from making any further voyage, unless they fall into other hands. My plans are thus disconcerted; and had I not already got up from Pará money and merchandise, which I calculate will cover a year's expenses in Peru, I should perhaps have renounced the undertaking. To get from Nauta to the first offshoots of the Andes, I shall have before me a voyage of from one to two months, doubled up in a small canoe, and exposed day and night to mosquitos. The last seventy miles will perhaps take

ten days, being a succession of rapids, from Yurimaguas to Chasuta, on the Huallaga. When travellers have all found it so trying coming down, you may judge what it will be going up; and I scarcely think, in my still weakly state, I could survive the fatigues of such a voyage.

At Nauta, I am told it is hardly possible to write, except in a hammock, under cover of a mosquito-net: we shall see. On the Casiquiare and Orinoco I have been pretty well broken-in to mosquitos.

I had some talk with the American who brought out the two steamers for the Peruvian government, who arrived here on his return from Peru (where he had remained several months) about the same time as I arrived from Venezuela. He gives a very unpromising account of Cis-Andine Peru, where life and property seem secured only by force of arms.

I must do what I can, and put up with discomforts I cannot avoid. Certainly the Barra, or anywhere in the neighbourhood, would no longer suit me: everything is much dearer than formerly, and Indians are no longer to be had, those employed on the public works having been taken by force from the upper parts of the Rio Uaupés, Japurá, etc. Officers ascending the rivers to command frontiers, or Padres to take charge of missions, furnished with orders from the Government to take men necessary to row their boats in any of the villages they pass, have stuck in the middle of their journey for lack of hands.

I suppose I shall have to bring my collections along with me when I return from Peru, most probably on a raft. There are no boards to make boxes of; and the people of Tarapota make the doors of their houses of old canoes (hollowed trees). Chairs and tables are not fashionable—perhaps do not exist, but I have learnt to dispense with them; in seven months' residence in São Gabriel, and other seven on the Uaupés, my boxes constantly served me for chairs and tables. *R. S.*

Corda's Fungi.

A sixth and last volume of Corda's great work is thus announced, as about to be published at Prague:—"Augusti Car. Jos. Corda, *Icones Fungorum hucusque cognitorum: Tomus VI. (ultimus), quem auctore ipso ex itinere Texano per mare Mexicanum reduce, infelici sorte abrupto, consulatis literariis ejusdem reliquiis edidit Joannes Baptista Zobel.*"

NOTICES OF BOOKS.

HOOKE, J. D., M.D., F.R.S. : *Illustrations of HIMALAYAN PLANTS, chiefly selected from Drawings made for the late J. F. CATHCART, Esq., of the Bengal Civil Service. The Plates executed by W. H. Fitch.* Large folio, 25 coloured plates. Lovell Reeve, London, 1855.

With the exception of the inimitable 'Illustrationes Floræ Novæ-Hollandiæ' of Ferdinand Bauer, and of the 'Delineations of Exotic Plants cultivated in the Royal Gardens of Kew,' by Francis Bauer, we think we may safely say, that no botanical work more beautiful in execution than the present has ever appeared, and, when we observe that the plants are selected from nearly a thousand of the choicest products of Himalayan vegetation, none more beautiful in point of subjects. A well written introduction informs us of the double object of the author in publishing it: first, to pay such a tribute to the memory of his friend, the late Mr. Cathcart, as should ensure the association of his name with the progress of Indian Botany; and second, to record the services he has rendered to that science, by having caused a magnificent series of coloured drawings of Himalayan plants to be executed in a previously unknown part of the mountain-range, and which, since his death, has been presented, through Dr. Hooker, to the Royal Gardens of Kew, by his sister, Miss Cathcart, of Alloway.

The brief memoir of the life of Mr. Cathcart is very interesting, and written with much feeling. Besides the twenty-four plates, the lithographed title-page is surrounded by an exquisite and tasteful group of thirty different species of Himalayan plants, designed and executed by Mr. Fitch.

The first three plates are devoted to that most remarkable Cucurbitaceous plant, and new genus, *Hodgsonia heteroclita*, whose great flowers are margined with copious tendril-like filaments, almost a foot long. Tab. 4 and 5, *Magnolia Campbellii*, is perhaps the glory of the book; as it assuredly is of the forests of Himalaya, at from 8-10,000 feet of elevation. Bags of the fresh-gathered seeds have been sent to us, by post, seemingly perfect, but they would never germinate. Tab. 6, *Talauma Hodgsonii* has much of the character of the *Magnolia*, but is far less beautiful. Tab. 8, *Meconopsis simplicifolia*, is a charming and very singular Papaveraceous plant, with large purple flowers; the most beau-

tiful and conspicuous of all the alpine flowers of Sikkim, if not of the whole Himalaya, at elevations of from 12–14,000 feet above the level of the sea. Tab. 9, *Meconopsis Nipalensis*, “sometimes five feet high, scarcely less beautiful than the preceding:” flowers large, chrome-yellow, and very numerous upon the large raceme. Tab. 10, *Decaisnea insignis*, a new Lardizabaleous genus, justly dedicated “to Professor Decaisne of Paris, one of the most learned botanists of the present day, and the author of a monograph of the Natural Family to which the plant belongs, which is a model of sagacity in botanical investigation.” We may add too, that the Professor is as estimable in private life as he is distinguished for his botanical acumen. Tab. 11, *Duabanga sonneratioides*, Ham.; a tree forty to eighty feet high, allied to *Lagerstrœmia*; with large white flowers, unfortunately exhaling an assafoetid smell. Tab. 12 exhibits a second species of *Aucuba*, *A. Himalaica*: “one of the many striking cases of botanical affinity between the temperate Flora of the Himalaya, and especially of the Eastern Himalaya, and China and Japan, and which affinity is not shared by the Flora of Europe.” Six such genera are enumerated; and nine are further mentioned as common also to North America. Tab. 14, *Begonia gemmipara*, is remarkable for the development of very peculiar gemmules in large cup-shaped receptacles from near the base of the leaf-stalks. Tab. 15 represents two splendid species of *Vaccinium*. Tab. 16, three charming climbers, most gracefully represented, *Codonopsis gracilis*, *Javanica*, and *inflata*. Tab. 17. A splendid scarlet *Æschynanthus*, *Æ. Peelii*. Tab. 18, *Buddleia Colvillei* “has no rival in the genus for beauty and graceful habit.” Tab. 19, a glorious plate, representing *Rheum nobile*, the most singular of the many fine alpine plants of Sikkim. “I first saw it from the distance of a mile, dotting the black cliffs of the Lachen valley, at 14,000 elevation, chiefly in inaccessible situations. They were upwards of a yard high, and formed pyramidal towers of the most delicate, straw-coloured, shining, semitransparent, concave, imbricating, decurved bracts, the upper of which have pink edges; the large, bright glossy, shining green radical leaves, with red petioles and nerves, forming a broad base to the whole. On turning up the bracts, the beautiful membranous fragile pink stipules are seen, like red silver-paper, and within these again are the short branched panicles of insignificant green flowers. In the winter, the dead, naked, black stems, projecting from the beetling cliffs, or towering above the snow, are in dismal keeping

with the surrounding desolation of that season." An admirable coloured vignette represents a landscape, with the object just noticed. Tab. 20, *Quercus lamellosa*, a glorious Oak, with leaves like a Spanish-chestnut, but tomentose beneath, and spikes of acorns with cups as big as apricots, and lamellated with concentric rings. These acorns are so abundantly strewed on the ground about Darjeeling, and so large and hard, as to render the roads dangerous, by causing the horses to stumble. Tab. 21, *Larix Griffithii*; first discovered by Griffith, but only now published; remarkable for its graceful, slender habit, and very long, lithe, cord-like, pendulous branchlets, that are set in motion by the slightest breeze. The erect cones are much larger than those of any other Larch, and are peculiar for the long, reflexed points of all the persistent bracts. Here too a small landscape represents the appearance of this tree and of the adjacent snowy regions of the Himalaya. "It delights to grow in deep valleys, but it prefers the dry, rocky, ancient moraines formed by glaciers that have centuries ago retired to higher levels in the mountains." Hence it appears that a cool bottom for the roots is desirable; and though it is quite true, as Dr. Hooker says, that the Kew plants abundantly raised from his seeds, and abundantly distributed, attained a height of 3 or 4 feet, and that "some have withstood the late severe winter of 1854-5 with no protection, whilst others have been quite killed,"—yet our experience tends to the conviction that the very severe losses of this plant have been occasioned by the heats of summer, and the action of too dry a soil upon the roots. The two best plants that have survived at Kew are in a shaded situation, with a cool bottom. Most of those that have perished, have done so after being planted out from the nursery-beds, and in the summer, when the leaves were almost fully developed. They seemed to be struck as with a blight, and gradually withered. Tab. 22, *Cyrtosia* (*Erythrorchis*) *Lindleyana*, "the most remarkable Orchid in all India;" a noble terrestrial, if not parasitic, leafless Orchid, 3 feet high, yet allied to, and bearing fruit in size and shape like that of, *Vanilla*. Tab. 23, *Vanda Cathcarti*. Tab. 24, *Paris polyphylla* (Sm.), a remarkable species, but allied to the Dahurian *P. verticillata* of Bieberstein.

A spirited nurseryman has but to make a selection from this work (though it is difficult to say what should be rejected), and send a competent collector to Himalaya, with instructions to gather seeds and roots, and it could not fail to answer his purpose, and to enrich our

gardens with hardy and other plants, that would recommend themselves, by their rarity and beauty, to all cultivators.

MOORE, THOMAS, F.L.S. : *The FERNS of Great Britain and Ireland ; edited by JOHN LINDLEY, Ph.D., F.R.S., etc.* Imp. folio. . Parts III., IV., and V. Nature-printed by Henry Bradbury. London. 1855.

We must refer to our favourable notice at page 185, etc., for particulars relating to Parts I. and II. of this really fine work.

Part III. commences with Tab. 8, *Allosorus crispus* (Cryptogramma, Br.). Accurate and expressive as the figures are, we cannot think it so good as many of the other subjects. The greens are not the bright hues of this charming plant ("herbaceous and lively green," as Mr. Moore expresses it), the barren fronds are too transparent, and the fertile fronds and the caudex are of a uniform dirty and spotty brown. Mr. Smith's views of this Fern being "Polypodioid, and not Pteroid," are maintained; in other words, the so-called involucre is no involucre, but "the margins of the pinnulets, somewhat pallid, but not altered in texture, are incurved over the sori." Mr. Moore's figures would lead to the supposition that these are altered both in colour and texture. Be that as it may, true Pteroid genera, especially *Cheilanthes*, will show every variety between a *membranous incurved* margin (by which it is presumed a real involucre is meant), and an *unaltered incurved* margin, or of the texture and colour of the frond. Tab. 9 exhibits *Polystichum Lonchitis*. Tabs. 10, 11 are devoted to *Polystichum aculeatum*, and certain varieties called *argutum*, *alatum*, and *lobatum*; and three other varieties are noticed. It will be seen that the *P. lobatum*, generally considered distinct, is here unhesitatingly considered (and, we suspect, rightly so) a mere form of *aculeatum*; while the *P. angulare* ("from which *P. aculeatum* is very difficult to be distinguished") is kept distinct, and made the subject of the two following plates, Tabs. 12 and 13, with several varieties. *Lastrea Filix-mas* is well represented at Tab. 14, and the fructifications are more effective in their colouring than usual. We have the variety *incisa* at Tab. 15; the still more remarkable forms *cristata* and *polydactyla* (which seem to be identical) at Tab. 16: and again, two very similar and small varieties, *pumila* and *paleacea*, hardly worthy of separate representation, at Tab. 17.

Fourteen varieties of this well-known Fern are enumerated, and their characters given, many of which, by the lovers of species-making, have been ranked as distinct species, so that a page and a half is devoted to synonyms.

Mr. Moore continues to execute his part most ably and conscientiously; nor can too much praise be given to Mr. Bradbury, for the manner in which he carries out this curious art of *Nature-printing*, apparently determined to overcome all difficulties. The result, as far as this work is concerned, will be most creditable both to author and publisher, and an honour to the country. We shall notice the future parts of this work as opportunity offers.

CHLORIS ANDINA; *Essai d'une Flore de la Région Alpine des Cordillères de l'Amérique du Sud*; par H. A. WEDDELL, M.D., etc. etc. Livraison I., 6 plates. 4to. Paris, 1852.

This work will constitute the sixth, or Botanical portion of the "Expédition dans les parties centrales de l'Amérique du Sud, de Rio de Janeiro à Lima, et de Lima au Pará; exécutée par ordre du Gouvernement Français pendant les années 1843 à 1847, sous la direction du Comte François de Castelnau." To this expedition Dr. Weddell was attached as botanist. The result of that journey has already produced a most important work on the *Cinchonas*, which we have noticed in our first and second volumes of this Journal, where will be found also (Vol. I. p. 30) a brief sketch of the author's route from Rio Janeiro on the Atlantic, to the coast of Arequipa on the Pacific. The Andine portion of this remarkable route afforded, no doubt, excellent materials for the work now under consideration; but this able botanist undertook another expedition, and which has doubtless contributed to swell his collection, in which his route lay for a great length in the line of the Andes.

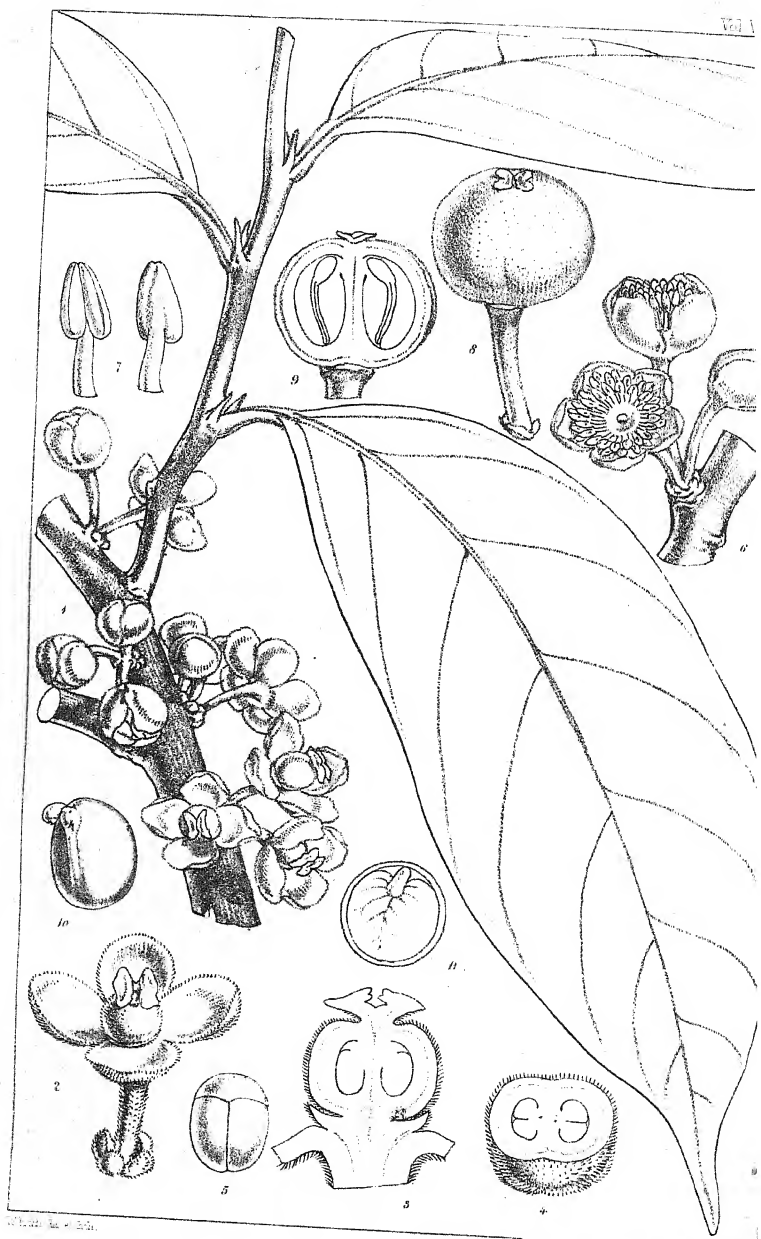
The 'Chloris Andina,' which this accomplished botanist and traveller has here undertaken, is destined to include the alpine vegetation of the Cordilleras, of which however he acknowledges that many points of the vast chain, lying parallel with the west coast of South America, still remain unexplored. His own herborizations in the Andes have been limited to the southern parts of Peru and Bolivia, extending from north to south through about 10° of latitude. For the flora of the countries north and south of these, special herbaria and publications, particularly

those of Humboldt, Bonpland, and Kunth, and the Flora of Chili, by M. Claude Gay, recently terminated, together with the collection of Hænke and Meyen, and Messrs. D'Orbigny and Pentland, and those of the Museum of Natural History in Paris, the rich Herbarium of Dombey, etc., will be consulted.

The limits of the region intended to be illustrated, will hereafter be treated of in the Introduction. The arrangement adopted is that of Adrien de Jussieu, commencing with the *Gamopetala*: and the work opens with a singularly interesting Tribe, viz. the *Labiatifloræ* among *Compositæ*. 1. Of *Chuquiragua*, 6 species are given, and 1 is figured. 2. *Flotowia*, 3 species, 1 figured. 3. *Doniophyton* (nov. gen.), 1 species, with figure. 4. *Nardophyllum*, 1 species. 5. *Onoseris*, 5 species, 1 figured. 6. *Aphyllocladus* (nov. gen.), 1 species and 1 figure. 7. *Plazia*, 3 species, 1 figured. 8. *Barnadesia*, 1 species, 1 figured. 9. *Mutisia*, 19 species, 2 figured. 10. *Pachylæna*, 1 species figured. 11. *Proustia*, 2 species, and 1 figured.—It would thus appear that the author gives a figure of at least one species of each genus: and these figures are admirably executed by M. Alfred Riocreux, now engaged by the Museum of Natural History in continuing the famous *Desseins de Velin*, begun by the artist of the celebrated Tournefort, Aubriet. Notes and observations are given when and where necessary. Specific characters and descriptions only accompany the *new* species. Besides the botanical value of this work, as illustrating an interesting and definite series of plants, it is of great interest, as contributing to our knowledge of vegetable geography.*

Press of other matter, and absence from home, have prevented our turning our attention to several important works which are recently published or announced. We particularly allude to Alphonse De Candolle's learned '*Géographie Botanique raisonnée, ou Exposition des Faits principaux et des Lois concernant la Distribution Géographique des Plantes de l'époque actuelle*,' 2 vols.; Drs. Hooker and Thomson's '*Flora Indica*,' first volume; Claude Gay's '*Flora Chilena*,' 8 vols. and atlas; the late excellent numbers of the '*Bulletin de la Société Botanique de France*,' etc.

* Dr. Weddell is also at this moment preparing a work on the Nat. Ord. *Urticaceæ*, and has for some weeks taken up his residence at Kew for the opportunity of consulting the collections of the Royal Gardens.



Notes written on a Voyage from Singapore to Banjermassing ; in a Letter from JAMES MOTLEY, Esq., to SIR W. J. HOOKER.

(Continued from p. 269.)

Martapura (Banjermassing), June 10, 1855.

I now continue the journal of my Sumatra excursion, which I was obliged last time to break off in the middle of a day, from a sudden alarm of the mail closing, a sort of thing we are very subject to in these out-of-the-way places. I think I left myself, in the afternoon of January 29, at the little settlement of Pulo Jumahat. About five o'clock we stopped at a deserted garden to cook; it was a jungle of young fruit-trees and sago-palms, and many trees of a handsome *Erythrina*, full of the pendent nests already described; the trunks, however, were too thorny to be climbed. There was also a curious *Ficus*, bearing its fruit in large, dense bunches on the stem and branches. The men were tired, but to stop was out of the question, from the number of mosquitoes. Near this place I observed a beautiful *Trichosanthes* in fruit; the pepos were of the size of an orange, and bright scarlet, hanging in long festoons from branch to branch of the trees. I saw here also, for the first time on this river, the beautiful little *Caryota furfuracea*, with its elegant, adiantiform leaves; it is often planted by the natives for the sake of the cottony pubescence which covers the leaf-sheaths, and which is used for caulking boats, and also for tinder; it is called "Cuput." Another Palm, however, whose name I do not know, I think a *Wallichia*, yields it in greater quantities; and in Java it is procured from an *Areca*. The banks are completely lined with the large *Musa* called "Pisang batu;" it has probably been planted originally, but is now perfectly wild, growing abundantly among the trees. I am inclined to believe that this is the original species of the cultivated Pisangs; it is cultivated everywhere by the natives, and is very constant in its appearance and character; unlike the other varieties, it is always full of seeds, although they are often abortive: it is coarse and hard, but has a flavour somewhat resembling a Burgundy pear. The natives consider it to contain more nourishment than the other kinds, which I think probable, as it has certainly more fecula. Just at dark we passed a small island, called Pulu Kamudi. As night came on, the mosquitoes arrived, and in such numbers as I have never seen before or since; the air was filled

with them like a cloud; they bit through trousers, stockings, and jacket like gauze. At last I put on a pair of long hunting-boots, and two thick flannel shirts, and wrapped up my head in a coarse towel; even then I could not sleep. The men had not this protection, and, though very much tired, they preferred pulling on to attempting to go to rest. No one who has not felt it, can conceive the misery and irritation caused by these insects when they are really bad; and the Malays, who generally have skins almost invulnerable to them, say that the rivers on this coast are the worst in the world for them. After several hours' pulling they became more tolerable, and we made fast for the night. The night was foggy, and I had just put my rifle into its bag, to save it from damp, when a tiger showed himself on the beach, but he went away before I could again get at the gun.

30th. We were off very early this morning. The river is visibly narrower, and the stream stronger, but still there are no signs of a hill, or even a bank. We passed another island today, called Pulu Lys: it is covered with large jungle, and was formerly a burial-place for the Europeans who died here, while the Dutch had an establishment at Indragiri. A little higher up are the remains of the house of the Resident, who was removed a few years ago, chiefly, I believe, on account of the extreme unhealthiness of the place in the dry season. We are now evidently approaching the haunts of men: the jungle generally has been cut, and, instead of trees, the river is bounded by large floating beds of luxuriant green grass and reeds, sometimes fifteen or eighteen feet high; behind are rice-fields, extending a mile or two from the river, which again are backed up by the long, dark line of primeval forest. Here and there, wallowing and splashing through the water, are droves of ungainly-looking buffaloes, with their never-failing companions, the white egrets, or padi-birds, perched upon their backs. There are now also a good many houses near the river, with a few Plantains, Kaput (*Eriodendron*), and Drabas (*Psidium*), about them. The people seem to make great use, for fishing, of small rafts constructed of the *Musa* stems, which are very buoyant. Bamboos, up to this point rather uncommon, begin now to form a feature in the landscape; the commonest are the yellow-stemmed Bamboo gading, and a very bushy, thorny, and crooked kind, which would make excellent fences. At two P.M. landed at a small campong, called Seligi: here there was a considerable quantity of a small, pink-flowered *Indigofera*; it is

called "Taram" by the Malays, and gives a good dye, but in small quantity. A number of women were employed in cleaning wax; the combs were very large, forming semicircles near two feet in diameter; they scrape off the covers of the cells, and let the honey run out, and then boil down the wax in water. They gave us some honey; it was sweet and good, and without the resinous flavour which spoils so much of the honey here, but, as usual, it was thin and watery. At five p.m. we reached the settlement of the Sultan; it is called Rangat, and consists of some hundreds of houses, completely buried in cocoa-nut and other fruit-trees. I made my boat fast before the Sultan's house, and sent to announce to him my arrival. After a short time the Si-baudhar, an officer who may be considered equivalent to a chancellor of the exchequer, came to introduce me to the great man. I found him sitting in the verandah of a pretty good wooden house, the Sultan Muda, or heir-apparent, being at his side. They were both stout, good-tempered looking men of forty to forty-five years old; they talked very intelligently, and smoked opium the whole time I was with them. The Sultan showed me with great pride some brass guns, made at Indragiri, and they certainly were beautiful specimens of Malay work. I was provided with a letter, which I produced, and it was handed to a secretary, who immediately read it aloud, much to the edification of some two hundred people who were round us. The people here speak excellent Malay, better than I have heard generally anywhere, except among the Malays of the high class in Singapore, where it is perhaps better spoken than anywhere else, except in the kingdom of Menang Kaiban, the cradle of the Malay power and language; Indragiri is however not more than 100 miles from Menang Kaiban, and, strange to say, the neighbours are at peace. I made inquiries of the Rajah about the coal, which was the object of my journey: he did not give me much encouragement about the main river, but showed me very good samples from the Chenaku, a river I have passed lower down, and he promised me a boat and a guide to go thither; after about an hour's talk I left him, and took up my quarters, by his desire, in a small schooner which he had moored in the river: she was about forty tons, and was named Sambarani, the name of the Pegasus of the Malay mythology. Here I was more comfortable than in my small boat.

I remained at Rangat, waiting for my boat and guide, until the 3rd of February; I could not walk about much, all the country being

under water, and the only result of this wasted time was the following list of the plants I saw cultivated about the houses at Rangai:—

- | | |
|--|---|
| Padi. <i>Oryza</i> . | Kawak. <i>Coffea Arabica</i> . |
| Jelli. <i>Coix</i> . | Pisang. <i>Musa</i> , many varieties. |
| Jelli Butu. <i>Coix</i> . | Jubbu. <i>Saccharum</i> . |
| Jagong. <i>Zea Mays</i> . | Nanas. <i>Bromelia</i> . |
| Sagu. <i>Sagus</i> , 2 sp. | Kladi. <i>Colocasia</i> . |
| Anan. <i>Saguerus saccharifer</i> . | Birai. <i>Caladium odorum</i> . |
| Klapa. <i>Cocos nucifera</i> . | Rambutan. <i>Nephelium lappaceum</i> . |
| Pinang. <i>Areca Catechu</i> . | Kumpal benang. <i>Nephelium</i> . |
| Sardang. <i>Corypha</i> sp. | Mantam. <i>Nephelium</i> . |
| Jukas. <i>Caryota furfuracea</i> . | Manyga. <i>Mangifera Indica</i> . |
| Pinang Sindawa. <i>Pinanga</i> sp. | Bachung. <i>Mangifera foetida</i> . |
| Manygista. <i>Garcinia</i> . | Belunu, |
| Mangista Ijan. <i>Garcinia</i> . | Buyei, |
| Butun. <i>Cassia fistulosa</i> . | Bambangam, |
| <i>Moringa</i> , 2 sp. | Romania, |
| <i>Capsicum</i> , 4 sp. | Nona. <i>Anona</i> . |
| Sarai. <i>Andropogon Schœnanthus</i> . | Nona Kaffre. <i>Anona squamosa</i> . |
| Liman Besar. <i>Citrus Decumana</i> . | Jantong Sapi. <i>Anona reticulata</i> . |
| Liman rupis. <i>C. Limonellus</i> . | Jaram. <i>Indigofera</i> . |
| Liman pont, | Gondola. <i>Basella alba</i> . |
| Liman manis, | Papaya. <i>Carica Papaya</i> . |
| Liman panjang, | Pangi. <i>Pangium edule</i> . |
| and 8 or 9 others. } <i>Citrus</i> . | Ahampaka. <i>Michelia</i> . |
| Dulima. <i>Punica Granatum</i> . | Ahampaka putch. <i>Michelia</i> . |
| Pala. <i>Myristica moschata</i> . | Janjong. <i>Talauma Candollei</i> . |
| Drarbas. <i>Psidium</i> , 2 sp. | Kananga. <i>Uvaria odorata</i> . |
| Jambu, 6 varieties. <i>Jambosa</i> . | „ <i>Euphorbia</i> sp. |
| Jongkeng. <i>Pergularia</i> . | Mawar. <i>Rosa Indica</i> . |
| Assam Jawa. <i>Tamarindus</i> . | Bunga gambri. <i>Jasminum</i> . |
| <i>Erythrina</i> , several sp. | Malatti. <i>Jasminum Sambak</i> . |
| Duka, | Mulatti kosta. <i>Guelharda</i> . |
| Lansat, | Irong. <i>Solanum Melongena</i> . |
| Ayer ayer, | Chakri. <i>Melia Azedarach</i> . |
| Manko, | Halia. <i>Zingiber officinale</i> . |
| and 3 others. } <i>Lansium</i> or allied genera. | Kunyet. <i>Curcuma longum</i> . |
| Sittni. <i>Citrullus edulis</i> . | 3 other <i>Scitamineæ</i> . |
| Petola. <i>Luffa</i> , 4 sp. | Ganda suli. <i>Canna</i> . |
| Jinum. <i>Cucumis sativus</i> . | „ another species. |
| Kahinon. <i>Cucumis Melo</i> . | Kanuming. <i>Murraja paniculata</i> . |
| Baligo. <i>Cucurbita farinosa</i> . | „ <i>Elaeocarpus</i> , 2 sp. |
| 7 or 8 other <i>Cucurbitaceæ</i> . | Kanbang sapatu. <i>Hibiscus Rosa-sinensis</i> . |

Sidah badak. *Opuntia*.
 Bamboo. *Bambusa*, several sp.
 Lukan. *Artocarpus incisifolia*.
 Nungka. *Artocarpus integrifolia*.
 Champada. *Artocarpus*.
 Jarap. *Artocarpus*.
 Durian. *Durio Zibethina*,
 and 2 other varieties.
 Kukam. *Flacourtia*, 3 sp.
 Nammana. *Cynometra*.
 Karambolu. *Averrhoa*.
 Bilumbung. *Averrhoa*.
 Kapus susan. *Gossypium fruticosum*.
 Kapuk. *Eriodendron*.
 Henai. *Lawsonia*.
 Bung kudu. *Morinda citrifolia*.
 Lada. *Piper nigrum*.
 Sirih. *Piper Betel*.
 Sirih buah. *Piper Sirihboa*.
 Lada panjang. *Piper*.
 Baiam. *Celosia*, 4 sp.
 Poko. *Mentha* sp.

Ang suna. *Pterocarpus Indicus*.
 Rami. *Bahmeria*.
 „ *Clitoria tenata*.
 Kachang. *Phaseolus*, 4 sp.
 Kachang panjang. *Vigna Sinensis*.
 Petch. *Parkia speciosa*.
 Kachang tana. *Arachis hypogæa*.
 Gambir. *Uncaria Gambir*.
 Pactra. *Impatiens balsamina*.
 Kauari. *Canarium commune*.
 Kamiui. *Canarium Moluccanum*.
 Jambu moruet. *Anacardium occidentale*.
 „ *Codiaeum variegatum*.
 Jaruk. *Ricinus communis*.
 Jurak hollandia. *R. spectabilis*.
 Jarak china. *Jatropha multifida*.
 Ubi kayu. *Jatropha Manihot*.
 Ubi pulek. *Convolvulus Batatas*.
 Ubi gadang. *Dioscorea triphylla*.
 Ubi mera. *Dioscorea* sp.
 Pandan harum. *Pandanus odoratissimus*.
Triphasia.

I will now leave the rest of my journey for the present, and answer your two letters of December 29 and February 17. I should indeed have been glad to have seen more of Java, but at the same time I considered myself very fortunate in getting the chance at all: it was only while I was waiting for the decision of this very slow-going Dutch Government. I shall remember your hint about the Java plants, should the opportunity occur at some future time, but I hope I am fixed to Borneo for some years to come. There is a man in Java now, a Mr. Henshall, but he is a mere commercial gardener. He has been out some time, and sends home large quantities of *Orchideæ* to Henderson's, I believe; but he is profoundly ignorant of botany. Borneo however will repay investigation: it is true that near the sea we have immense marshes hardly above water, but behind them are hills of gravel, sandstone, and eruptive rocks, having on the surface large grassy plains, with small scattered patches of wood. Having been obliged to survey this country very minutely, in consequence of a stupid mistake in the Government Engineers' chart, I have had the opportunity of running a good deal about; and though obliged to travel too quickly

to botanize much, I have still seen much of the vegetation, and have got together more than 500 species. The way I manage is to have the tin vasculum always on a man's back behind me, so that if I see anything I can put it in, and I am obliged to get Mrs. Motley to dry them, for I am out all day, and sometimes several days together. The survey will however soon be over, I hope, and then I shall not be quite so nomadic. Besides the 500 species, I have above some 100 or so more Orchids, which I keep in the garden, and dry a specimen when they flower, always putting a flower or two in spirits, with a corresponding number; but I do not succeed well with the *Orchideæ*; and now that it is the dry season, I lose many of my plants for want of a proper place to put them. I am living at present in a Government building here, for until our boundaries are put all right, I do not know where we shall work coal, and there of course I must live, so it will yet be some time before I am settled; when I know my location, I shall certainly make a garden of Ferns and *Orchideæ*. I am looking forward with great anxiety to the time when I shall be able to get further inland. We have close by a tolerably extensive range of hills 2000 to 3000 feet high, and some further off, which I believe must reach 6000: this is high enough to give me quite a new flora. I got one *Rhododendron* at Brune at 760 feet, but only just on the summit: the specimens of this you must now have. The highest elevation I have yet been on here is an isolated serpentine hill about 1000 feet; it was very bare and dry, but I found seven *Orchideæ* I had not seen before, and a new *Casuarina*, of which however I saw no flowers or fruit. I shall have to return to this hill hereafter to seek mineral veins; and I believe the valleys about it, which I must then explore, will yield me beautiful Ferns. We have many *Loranthaceæ* here. I know certainly six *Loranthi* and two *Viscæ*, not including four *Loranthi* and one *Viscum* which I found at Labuan. I am now trying an experiment with them which, if it succeeds, will be very interesting. I am grafting and budding them with every variety of joint on different plants, of which I believe *Melia Azedarach* and *Citrus Decumana* are the most likely to succeed; so far they look well. If I could send you a Ward's case with living *Loranthi*, it would be a fine prize for you, and really I have great hopes. I shall try them also by seed, but this is difficult to find, as the birds eat it all before it is ripe. We have certainly a *Rafflesia* here, but I have not yet seen it; it must be very rare, for I

have repeatedly searched the only locality I have been able to get pointed out to me without success. I am not sure of its nidus, for in that spot there are three or four large species of *Cissus* or *Cissampelos* growing mixed together. I feel however no doubt of its existence, for it was found by Dr. Greiner, a very intelligent man, the surgeon to the Government coal-mines, and he is at least botanist enough to know a *Rafflesia*. I hope to get a specimen some day; it may be a new species, for it is described as much larger than the *R. Patna*; and the *R. Arnoldi* has hitherto been found only in Sumatra. I wish I could get at my Mosses for a week or two, to put them in order to send home, but it is impossible just yet. My *Glumaceæ* are ready, or nearly so; they will be about 140 species, and will make 20 to 25 very full and good sets. I am now making a set of Ferns, and as this is nearly virgin ground, I hope they will be interesting. I am also preparing your set of 500 (which includes the *Glumaceæ* and Ferns, so far as I have gone). I retain a set with corresponding numbers, and I hope, as you kindly offer to take so much trouble in naming them for me, that you will oblige me by accepting the set sent. You will find plenty of *small* things among them, for I have rather a microscopic eye. I shall obtain a few more *Cryptogams* here, though not so many as I supposed from the dampness of the climate, and I have not now the pleasure in seeking them that I had, for I possess no microscope. It was the present of a very good set of British Mosses from Mr. Bichenor, when I was quite a boy, which first turned my attention towards that beautiful tribe, but I think I am now nearly as much in love with the Ferns. It will be very difficult to send living plants from hence, as all the vessels loading here go to Batavia, and they would then have to be shipped again to Singapore. I speak now of *Orchideæ* and such plants: a few weeks' delay for a Ward's case is of less importance, and they could be shipped at Batavia direct for England. I have one disadvantage here, to which however I got pretty well accustomed at Labuan, that is, that I must work quite alone; there is not one who has the smallest sympathy with anything scientific except Dr. Greiner, whom I rarely see. I do not get on very fast with the language; the reading is not difficult, and the writing I shall manage, because I can learn it out of books, but the pronunciation is a terrible difficulty, almost an impossibility, for me; still, as every one speaks Malay and nearly all French, I manage pretty well, but it will be a great advantage when I

can write my letters and reports in Dutch, as these things often suffer a little by translation. Banjermassing is, as I dare say you know, the great place for the Rattan trade; all the finest ones come from here. I hope to send you some of them alive, or at least the seed. Will the seeds of *Aroideæ* travel, and if so, in what way best? I could often enclose a few seeds in my letters. I send you now some seeds of a little *Cucurbit*, of no beauty, but the section of the young fruit seemed to me to show the construction of the pepo with peculiar clearness, and therefore I believed it might be interesting to you. It is extraordinary what a number of plants there are here, chiefly climbers, with which I am quite familiar, and yet I cannot find a trace either of fruit or flowers; and it is strange too how sometimes you find out their secrets by accident. A few days ago I was exploring a wooded dingle for coals, when one of the men showed me what he was pleased to call jungle potatoes just appearing above ground. They had in fact just the appearance of half-dried potatoes, but on breaking one I found it to be the fruit of a *Ficus* growing in small groups on the roots. I immediately set to work to trace the root to its origin, which was some twenty feet away, and I found it proceeded from a tree common enough here and at Labuan, and whose fruit I have sought ever since I came out to India. You will have specimens of it among the rest. I like the *Fici*, many of them are such noble trees, and we have here a wonderful variety of them. I send also the seeds of a little *Aristolochia*, more curious for its pendulous, basket-like seed-vessels than its flowers, which are small; but at least it does no harm to put them in the letter. When you have seen it once flower, you will probably throw it away. I enclose it rather because it happens to be on my writing-table than for any other reason. I hope by-and-by to send you the seed of an interesting plant from Japan, *Corchorus pyriformis*, Bl., which is said to afford the fibre of which the finest grass-cloth is made. I had the seed from Buitenzorg, and it is flowering freely with me. We have here another fine fibre plant, the *Boehmeria candicans*, from which was prepared a beautiful silky white fibre, which got a medal at the Exhibition under the name of Ananas Fibre. It was sent from Java by a Mr. Weber, a gum-tree planter. He showed me at his house the medal, the fibre, and the plant, which I find also here.

Notes on the Cultivation of COTTON in the "YORUBA COUNTRY,"
 Western Coast of Africa; by the late DR. E. G. IRVING.*

I. On the species and varieties of Cotton cultivated or growing wild in or around Abbeokuta.

The Rev. Mr. Crowther—Native Missionary of the church in Yoruba—gives the following "kinds" of Cotton, under the head of Owú Cotton (see 'Yoruba Grammar and Vocabulary'), viz.:

1. *Owú*: Cotton, thread, wick.—2. *Owú-Akese* (pronounced Akehshéh), a kind of very fine white cotton, bearing small pods.—3. *Owú-ògódó*, a kind of cotton bearing large pods.—4. *Owú Yawoure*, a kind of very white cotton used chiefly by the Fulahs, with red flowers and small seeds.

The Egbas name and are acquainted with five sorts of Cotton, viz.:

1. *Owú* (*ògodo* of Mr. Crowther, a name only used in Yoruba, and also the name of a disease, I believe a kind of boil, which the capsules of this cotton are supposed to resemble). This is the common cotton of the country, and that universally cultivated and manufactured into caps, cloths, trousers, etc.—2. *Akese*, woody, with dark purple-pink flowers, and green-seeded silky cotton. Said to be cultivated (but sparingly) for the finer articles of chiefs' dresses.—3. *Akese*, with yellow flowers, fine silky cotton, and seeds covered with grey, silky, close fuzz.—4. *Pón* (pronounced Kpwong): the word in Yoruba means "to ripen, get yellow, or be red." With yellow flowers, lobed and very oblique-angled small leaves, smooth habit, and brown or nankeen-coloured cotton enveloping the seed.—5. *Pedofa*.

I shall now give the characters of these different kinds of cottons, comparing the descriptions in Dr. Royle's work, with the actual examinations of living specimens.

1. *Owú* (Yoruba and Egba). *Gossypium Barbadosense*, Linn.

Character.—Perennial, shrubby, 4–9 feet high. *Stem* angular and furrowed, smooth and shining. *Branches* all primary, at nearly right angles with the stem. The *petiole*, *peduncle*, outer *calyx* (external bracts

* The notes on the Cottons of Western tropical Africa, here published, accompanied by specimens and excellent drawings (we may add, too, by a rich general botanical collection), were scarcely received by us, when the unwelcome news arrived of the death of this amiable and accomplished gentleman, at Lagos. The latter part of his life had been devoted to the amelioration of the African people: and in his death science and the cause of humanity have experienced a loss which cannot easily be repaired.—ED.

and involucrel), and inner calyx studded with tuberculated black points. *Leaves*: the upper ones are often simple and cordato-ovate, or are partially lobed on one side, acute at other times, three-lobed; the lower and larger five-lobed; *lobes* ovate, acute, with obtuse angles, generally smooth, except on the lower surface, where at times they are a little pubescent, and there are from one to three glands below. *Stipules* of the young shoots are falcato-lanceolate or awl-shaped, of the flower-bearing stalklets broadly falcate, often foliaceous on one side. *Outer calyx* large, appressed in whole or in part, closely surrounding the capsule, deeply lacinate. *Flowers* large, showy, and yellow. *Capsule* large, ovate, more or less deeply pitted with points of the size of a pin-head, three- or four-celled, sometimes five-celled; seeds six or seven (perhaps more). *Seeds* various, and presenting the following differences:—1. Black and naked, perfectly free from down or fuzz, excepting a small fawn or greenish-white tuft at one extremity.—2. Entirely covered with a closely adhering greenish-grey or whitish fuzz.—3. Resembling both the preceding, one half perfectly clear, the other fuzz-covered.

Remarks.—Here are several points of interest which I have not yet ascertained experimentally:—

1. Does the black clean seed without fuzz always produce the like when planted?

2. Or will the same seed in time produce all the varieties? as seems to be the prevailing opinion.

3. Are all the different varieties of seed given above ever found on the same plant? The few observations I have made, since asking myself this question, incline me to answer in the negative, and I have hitherto found only clean black seeds on one bush, fuzz-covered seeds on another.

4. Are there any marked differences in the habit, form of leaves, etc., of plants producing these different seeds? I believe I can readily distinguish the black naked-seeded plant by its greater coarseness of stalk and leaf, the darker colour of the latter, and its more elongated lanceolate lobes. But on all these points I am not satisfied, and will make further inquiries.

With regard to the quantity of cotton cultivated, it is impossible to ascertain anything with certainty. No records are kept, no statistics attainable, with the exception of one fact, which may give us some idea on the subject. Abbeokuta is supposed by some to contain 100,000

inhabitants. Ibadan is much larger, and supposed to contain 120,000. Iyesa and Ilorin are as large or larger. The whole Yoruba country is supposed to contain between two and three millions of inhabitants, all of whom are clad in cotton cloth, chiefly of their own growth, besides which, large quantities are traded with to other places.

2. *Akese (Flore purpureo)*.

Character.—Bush, 7–10 or more feet high. *Stem* hard, woody, rises from the ground, and numerous branches soon proceed from it at an acute angle, which are long, slender, virgate, bending gracefully. *Stem* and *branches* are greyish-white, with many small tuberculated points of the same colour. *Stipules* subulate or subulato-lanceolate. The younger parts of the plant, as the young shoots, petioles, etc., and younger branches are purple or purple-green, downy or hairy. The *leaves* are soft and velvety to the touch, dark green, with a reddish tinge, lobed. The upper, smaller, and younger three- to five-lobed; the larger, older, and lower seven-lobed; the two smaller lobes towards the petiole. *Lobes* lanceolate and acute, angles rounded, with or without intermediate lobules, of which the two central are free; the two lateral either wanting, or, when present, only partially detached. *Veins* pink, chiefly on the lower side, where also most prominent, finely punctated with black spots, rendered more distinct by transmitted light or the employment of a lens. One gland on the leaves, surface of the midrib not far from its commencement. *Petioles* purple, or purple above, green below, hispid, woolly or hairy, moderately long, dotted. *Flowers* axillary, solitary near the end of the shoot, or most generally half a foot below it. *Peduncles* or flower-bearing stalklets, slender, shorter than the petioles; at three-fifths of the distance from the stem are two falcato-lanceolate, often serrated, black-dotted stipule, from which often proceeds a small three- to five-lobed leaf. *Petals* are of a dark pink-purple, highly ornamental, with a darker patch near the claw, where also at the commencement is a narrow line of yellowish-white. *Outer calyx* (ext. bractæas or involucl) spreading so as to display the inner or true calyx, the constricted neck of the corolla, cordate at the base, either entire or generally tridentate at the apex. The middle tooth disproportionately larger, often one or two toothlets at the sides. Colour purplish, especially towards the centre, more green elsewhere. *Capsules* trigonal, the angles rounded. Internal structure well marked by the impressions and lines externally, ovate,

acute, beaked, pitted finely, pink-purplish, with tinges of green, three- to four-celled, generally six-seeded. *Seeds* emerald or sea-green, enveloped in a fine, silky, snow-white, soft, long-stapled cotton, and when this is removed they are found to be covered with a close, silky, sea-green or emerald fuzz. *Staple* long.

Remarks.—This is an exceedingly graceful and ornamental plant. Its slender and bending purplish branches, its fine deep-purple flowers, and purple capsules, from which the snow-white silky and delicate cotton depends, scarcely concealing its bright emerald-coloured seeds which it envelopes, renders this a very pleasing plant. I am informed that this *Akese* is cultivated here, as I believe it is in several other parts of the world, for the finer cloths, etc., of the chiefs; but this I have not seen myself. Behind the Mission House at Aké, in this town, are several fine plants, growing on a part of the Aké hill, amongst the large blocks of felspathic-porphyrific granite. It was raised from seeds planted by Mr. Townsend, about two years ago. These seeds were procured from another plant in the neighbourhood, which the person who bought them stated he had known for many (six or seven) years. There are several detached plants to be seen in Abbeokuta itself, amongst the houses, and also a few cultivated patches; but I am assured by an old farmer here, that he never saw this kind of *Akese* when a boy; it appears therefore to have been introduced. It is cultivated and used also for medicinal purposes.

3. *Akese* (*Flore flavo*).

Character.—A bush 4 or 5 feet high. *Principal stalk and branches* whitish-grey, with a more brownish tint than that last described, dotted with small tubercles of the same colour, branching from the base. The young stalks, shoots, peduncles, and stipules very hirsute, woolly, black-spotted, light-greenish coloured. *Stipules* of young shoots long and subulate, with a strong midrib, and falcate-lanceolate. *Leaves*, more woolly than the purple *Akese*, feel thick to the touch; *upper leaves* three-lobed; lower five-lobed. This is often reversed; *lobes* rounded or ovate-obtuse, emarginate, mucronate; angles obtuse. *Leaves* small, one gland beneath. *Flowers* axillary, solitary, yellow, with a pink spot on the claw, showy. *Involucre* strongly serrated and toothed, patent, with few spots. *Inner calyx* dotted with rows of black spots, no purplish tinge on the stalk. *Capsules* rounded, ovate, filled out, shortly and abruptly rostrate, glaucous, smooth,

six- or generally seven-seeded. *Seeds* covered with close, short, glistening "fuzz," enveloped in a fine, silky, soft, glistening wool of a dazzling white.

Remarks.—I only know this by there being a few plants on Aké rock, near the Akese last described; but I cannot find out whence they came. The site of their growth, like every foot of earth in and around Abbeokuta, was at one time in a state of cultivation. The old farmer on whose farm I have a small piece of ground for experimental purposes, informs me that when a boy he remembers this Akese (which he calls "Akese Egba," to distinguish it from the other, or Akese Oibo, white man's Akese); but that it was very rare, only a few plants having been raised, and kept jealously secluded from the "profanum vulgus" by the medical fraternity, who here, as often in more civilized communities, are great mystery men, and that in a large town perhaps only two or three plants would be found, and these not allowed to be taken to the farm.

4. *Pón* (pronounced "Eh-kpwong"), or *Pówú* (Eh-kpowu). Brown or Nankeen-coloured Cotton.

Character.—Shrubby, bush 4-5 feet high, smooth. *Leaves* as if truncated, lobed, the angles very oblique; upper and smaller leaves generally three-lobed; lower larger and older, five-lobed; basal lobes smallest; *lobes* short, broadly ovate, acute; the young shoots pinkish above, slightly hairy; leaves smooth, perfectly free from hairs, glaucous, small, compared with the "Owú" or common Cotton. *Petioles* smooth or slightly downy, long, at right angles with the stem, tinged with pink on the upper side. *Stipules* broad, falcato-lanceolate. *Flowers* (not seen, but) yellow. *Involucel* laciniate, cordate at the base, light-coloured. *Capsules* ovate, round, filled out, smooth, glaucous, no pits or punctures, shortly rostrate, three- or four-celled. *Seeds* six to seven, small, covered with closely adhering short fawn-coloured fuzz, enveloped in tawny or fawn-coloured cotton, with short staple.

Remarks.—There is a very marked difference in the appearance of this plant as seen in a field of Cotton, from the "Owú," or common Cotton. The smaller size of the leaves and their truncated appearance, their shorter lobes and very oblique angles, readily serve to distinguish them. From all I can learn it does not appear that the colour of the Cotton is merely a temporary and accidental variety. Seeds which I purchased in the market, and planted, have produced seemingly in all cases exactly the same quality of cotton, and the farmers here say it

will do so for ever. I have however seen in fields of "Owú," or common Cotton, plants not to be distinguished by the most minute examination, and yet bearing a fine snowy-white silky cotton of good staple, and the seed covered with white longish fuzz.

5. *Fedofu*.—Several people have described this cotton to me as being of fine quality, and the plant having small leaves; but whether it be merely a quality of cotton, a variety, or a species, I do not know to any certainty.

Having given the characters of the "Cottons" found in this part of Africa, I shall now, in great diffidence and in the absence of proper works of botanical reference and adequate botanical skill and experience, endeavour to assign the proper scientific name to each. It appears to me that the "Red-flowered Akese" is the *Gossypium arboreum*, but in nearly all the capsules I have examined there are six, or more generally seven seeds, instead of four or five, as described in the characters of *Gossypium arboreum*, given in Dr. Royle's work. The Cotton also appears to me to be without any yellowness of tinge, but, on the contrary, brilliantly white. The leaf also strongly resembles that in the drawing of the *Gossypium Indicum* by Colonel Sykes, and also in that of Dr. Roxburgh's (pl. iii.) of the Dacca Cotton, in the same work; and Colonel Sykes' sketch of the *G. Indicum* also much resembles the port and habit of the "Red Akese;" but the serrated and lacinated involucre of both his figures are widely different from the tridentate and otherwise all but entire outer bracts of the former plant. The rounded short-pointed capsule in the drawing of Colonel Sykes is also very different from the very pointed ovate capsule of the "Red Akese."

The "Yellow Akese" appears to be the *Gossypium Indicum*, Lam. (*G. herbaceum*, Linn.), or that variety with the lobes rounded and mucronate, and the external bracts dentato-laciniate. There also the seeds are six or seven, instead of five, as given in Dr. Royle's work. The Fawn-coloured or Brown Cotton appears to be *Gossypium religiosum* of writers, from the colour and its permanence (?) when cultivated; Of the "Owú," or Common Cotton, *Gossypium Barbadosense*, I do not doubt we possess both the "Sea Island" and the "Upland" varieties, but further investigation is required. Of the Owú Yauwure of Mr. Crowther I know nothing, unless it be the Red-flowered Akese.

Aké, Abeokuta, February, 1855.

The Voyage of H.M.S. HERALD.

The following account of the recent cruise of the surveying voyage of Captain Denham, in H.M. Surveying-ship Herald, has been communicated by J. McGillivray, Esq., the chief Naturalist of the Expedition.*

"We sailed from Sydney on May 27th for New Zealand, and on our passage across, when nearly 300 miles from land, deep soundings were obtained on the detached bank to the westward of Cape Maria Van Diemen. We reached Auckland, June 8th, and left the watering-place at Waieki on the 22nd. On the 28th and 29th, the ship passed over two of the eastern positions assigned to the Rosaretta Shoal, on which occasion 859 and 930 fathoms of line failed to reach bottom. On July 2nd we reach the Sunday Island of whalers (Raoul Island of its discoverer), where we remained surveying until the 24th, during which the ship took up no less than six anchorages, not one of which is safe, except under very favourable circumstances, such as we did not meet with. An American of the name of Halstead (with two Kingsmill women, and some half-caste children), has settled here, and supplies whalers in their season with wood, stock, and vegetables: his flagstaff is in lat. $29^{\circ} 15' S.$, and long. $192^{\circ} 5' E.$, or $177^{\circ} 55' W.$ After leaving Sunday Island we visited three positions of shoals to the northward, and two of Vasquez Island, with the usual negative results; as the latter may have gone down, it was diligently searched for with the lead. Minerva Reef, of which so many contradictory accounts and positions have been published, was next sought for, and found to consist of two detached reefs. North Minerva is nearly $8\frac{1}{4}$ miles in diameter, with a navigable lagoon and entrance to leeward. The centre is in lat. $23^{\circ} 38' S.$, and long. $178^{\circ} 46' E.$ On a bearing $S. 40^{\circ} W.$ (true), distant eighteen miles, is the South Minerva, which in shape somewhat resembles an hour-glass or the figure eight, and extends $4\frac{3}{4}$ miles in length, from E. by N. to W. by S. The centre is in lat. $23^{\circ} 57' S.$, and long. $179^{\circ} 2' E.$ Ships may enter the eastern lagoon of this reef; the western one is blocked up. After much unsuccessful searching for neighbouring shoals in their assigned positions, we proceeded to Moala, one of the southernmost of the Feejee Islands, where we remained from the 4th till the

* The botanical collection of this portion of the survey, formed by Mr. Milne, has been safely received at the Royal Gardens.

9th of September. A survey of the anchorage was made. The natives were very friendly, and we obtained by water a large quantity of yams. A Tongan missionary teacher is established there. After fixing and surveying Mumbolitha, a small detached reef between Moala and Ngau we anchored on the 12th in Soieke Bay, on the west end of Ngau, where we remained a fortnight, and surveyed the neighbourhood. At this part of Ngau the natives are mostly *lotu*, or nominally so, but elsewhere on the island they are reputed to be the worst cannibals in Feejee; they lately killed and ate two people from Levuka, who went there to trade. Crossing over to Ovalau, we moored ship off the town or village of Levuka, on the 29th, and remained there, with the exception of one night at sea, for eight weeks. Ovalau is perhaps the most important island of the group, from being the principal seat of trade (insignificant though that be), and the head-quarters of most of the white residents in Feejee, besides possessing a capital harbour. During our stay a survey was made in the boats of Ovalau, its reefs and anchorages, and the islands immediately adjacent, as Moturiki, etc. We found the Feejees in the same distracted state of petty warfare which we were told had existed for several years, and which, I am sorry to say, there seems no immediate prospect of seeing concluded. Several conferences were held on board the 'Herald' at Levuka with a view to settle various points at issue between the native chiefs and the white people, as well as between the chiefs themselves; in the latter case with a view of assisting to bring about peace. At the last of these Thakambau was present, the well-known chief of Mbau, often, but erroneously, styled Tui Viti, or King of Feejee. His political power has been gradually declining of late, from causes which it would be needless to mention here. His promise to Captain Erskine (which he has kept) has prevented him from revenging himself on the whites, who have been continually supplying his enemies with arms and ammunition, and even stopped a supply ordered by him from Sydney when within twenty miles of Mbau. He has also recently shown extraordinary moderation in restraining his own people from taking any offensive steps in warfare, and has not availed himself of several opportunities he had of striking sudden and unexpected blows on some of his enemies—as Ratu Mara and Koroi Rabulo, for instance—to the great dissatisfaction of his followers, who are thereby more inclined than formerly to enter into any plot against him. This great change in his line of conduct—for no one

is more conversant with, or has more practised, all the Feejeean details of treachery, murder, torture, cannibalism, etc.—is, to say the least of it, remarkable, and it has been ascribed to two causes. That which I believe to be the true one—but I here express only my own individual opinion—and highly creditable, if such be the case, to the long continued efforts of the missionaries to move his conscience, is of course ridiculed by those who derive their impressions of Feejee from the white traders and others of Levuka with whom they choose to associate, as we find the moral influence of the Mission gradually tending to lower them in the eyes of such as are beginning to appreciate the difference between right and wrong. I do not include all the white traders in this, for there are several honourable exceptions, at the head of whom I would place Mr. D. Whippy, the American Vice-Consul. At Levuka, a person of the name of James Merry (*alias* Ginger) was detained on suspicion of being one of the convicts who piratically seized the *Lady Franklin*. One of the boats of that vessel, and various other articles, furnished strong evidence in the matter, since rendered unnecessary by important disclosures, which will afterwards be adduced on the trial. Two others of the gang, Joseph Davis (*alias* Murphy), and Dennis Griffiths (*alias* Dan), who had lately made a murderous attack upon the crew of a small trader, were sent for to Kantavu, and brought safely on board, after the absence for three weeks of the party despatched for that purpose. Meanwhile the convicts had stolen a boat, and, with the aid of two Feejeean women, escaped to the large island of Naviti Levu, where they were ransomed from the natives for five muskets and a barrel of gunpowder, under circumstances most creditable to those sent from the ship on this errand. At this time an American vessel (the *Dragon*, Captain Dunn) arrived from Sydney, on October 28th, and brought the news relative to the probability of Mr. Benjamin Boyd's being still alive at Guadalcanar. We are now on our way to the last-mentioned place. Leaving the Feejees on November 24th, we reached Aneiteum on the 28th; we had visited this place last year, and the first object to attract attention was the new church and mission-house at Aneligaubat. The progress of the Mission since our last visit had been most satisfactory: the *lotu* has firmly fixed itself in the last stronghold of heathenism—the central district of Itaho; and war, which once engaged the attention of the natives of Aneiteum for about nine months in each year, has entirely ceased. Only three months ago a chief of Tanna came over to

Aneiteum to see—for he would not otherwise believe it—a neighbouring island where peace prevailed. He could not imagine how men of different tribes on one island could live in harmony, until he saw it. We left Aneiteum on December 1st, and on the following morning hove to for an hour off Futuna, or Erronan, to land an Aneiteum missionary teacher and his wife, and then proceeded to Tanna, which we reached in the evening, anchoring in Port Resolution, where Captain Padden has an establishment. Finding the Juno here on her route to Sydney, *viâ* Aneiteum, More, and Isle of Pines, we are glad to avail ourselves of an opportunity, the first for six months, of writing to our friends. We sail this afternoon for Guadalcanar, and do not expect to reach Sydney until February, long before which time we shall have been on reduced allowance of provisions. The only casualties this cruise have been the deaths of a passenger (son of the Captain), and one of the seamen, named Ruthen; the latter from consumption.”

Second General Report of the Government Botanist of Victoria,
on the VEGETATION of the Colony.*

[The unwearied zeal and indefatigable exertions which have characterized the long and arduous journeys in the interior of this important Colony, deserve some more permanent record than that which is afforded by the mere Government Reports, and we gladly publish the present one in our pages.—ED.]

Botanic Gardens, Melbourne, 5th October, 1854.

In obedience to instructions from His Excellency the Lieutenant-Governor, I do myself the honour of transmitting the Second Annual Report on the progress of my botanical researches.

Instructed by the Government in October, 1853, to examine the vegetation of the Grampians and of the adjacent ranges, and to visit afterwards such districts as I deemed most advisable to explore, I commenced my journey, in accordance with these directions, on the 1st of November, 1853.

The low land between Melbourne and Mount Sturgeon offered but very few novelties to the collections formed during the previous season; but in the Grampians, the Serra, and the Victoria Ranges, I had an

* See our Vol. VI. p. 123, for the first Report, there published.—ED.

opportunity, by ascending the most prominent heights, to increase considerably the series of plants already discovered in these localities by Sir Thomas Mitchell during his exploration of this country. Many of these plants belong not only exclusively to this Colony, although interspersed with such as inhabit the mountains of New South Wales, Van Diemen's Land, and South Australia, but are even in some instances restricted to solitary heights, an observation confirmed by similar instances of isolation of certain species occurring at the Table Mount of the Cape of Good Hope, in the mountains of North America, and other parts of the globe. The subalpine summit of Mount William proved in this respect to be exceedingly interesting. I was informed that these mountains contain malachite; and, judging from their similarity to the Mount Lofty and Barossa Ranges of South Australia, in which several copper mines have been opened, I feel convinced of the correctness of this statement.

The early heat and the consequent scantiness of water during the last spring, rendered it impossible, in proceeding from the Grampians to the Murray, to pursue a more westerly course than along the Avoca; but to obtain the advantage of observing the gradual change of the Mallee vegetation from south to north, I bore away westerly to Lake Lalbert, and thence reached the Murray in the beginning of December. Following partially the course of this river and partially the tracks through the desert, I travelled as far westerly as the junction of the Darling. During this excursion it was surprising to me to observe in the north-western parts of the Colony a remarkable accumulation, not only of those plants formerly observed along the Lower Murray, but also numerous species from the steppes around Lake Torrens, which I had but recently commenced disclosing to botanical science, and it appears therefore that the subtropical Desert Flora terminates only in this latitude. Besides several hitherto unknown plants, descending along the Darling and Murrumbidgee from the north-east into our Colony, others even reappeared here from the west coast of Australia, so that for these reasons the materials for the Flora of Victoria became at this time considerably augmented, more particularly in the Natural Orders of *Compositæ* and *Salsolaceæ*. The salt-plants here alluded to contribute largely to render these desolate places fit and often preferable for sheep pastures. The following useful plants from these localities are entitled to particular notice:—*Myoporum platycarpum*, a graceful tree,

exuding a saccharine secretion from its stem; *Cucurbita micrantha*, a small species of Melon, as bitter and probably as valuable as the medicinal colocynth; *Santalum Persicari*, a dwarf kind of Sandal-tree, of which the root-bark furnishes an amylaceous food to the natives. It has been repeatedly stated by travellers, that a small supply of water may be relied upon from the root of *Eucalyptus dumosa*, one of the Mallee bushes. The Murray lagoons, which are periodically dry, furnished a small number of plants, allied or identical to foreign, chiefly Indian or African species, and consequently important to phytogeography—*Mollugo*, *Glinus*, *Ammannia*, *Jussiaea*, *Epaltes*, *Lycium*, etc.

Returning from the Darling, I resumed my journey along the Murray River, with a deviation to Mount Hope, up to Albury, where I arrived about the middle of January of this year.

Desirous to devote the summer months to the exploration of the Australian Alps, I chose the Mitta Mitta line for further operations, ascended and crossed the Gibbo Ranges at an elevation of at least 5000 feet, and followed thence again the course of the Mitta Mitta into Omeo. At the Gibbo River argentaceous lead ore has already been discovered by the Rev. Mr. Clarke.

From here I attempted, though vainly, to reach the Bogong Range, probably the highest point in this island-continent, being compelled to retreat by the extensive bush fires then raging in the intermediate mountains. The summit of this range, covered with eternal snow and glaciers, can hardly be estimated of less altitude than 7000 feet.

In order now to accomplish the examination of the Alpine Flora on the Eastern frontiers, I started for the Coborras Mountains, the most prominent points of the great dividing range within the borders of this Colony. Not only these mountains, but also the greater part of the interjacent plains or plateaus, are of a truly alpine or subalpine nature, ranging in elevation from 5000 to 6000 feet above the level of the ocean. As some of the highest sources of the Murray and of the Gipps Land rivers rise in this vicinity, the supply of water is plentiful. The valleys are either covered with spongy Mosses (chiefly *Sphagnum*), which become transformed into peat, or they produce nutritious Grasses, some luxuriant enough to recommend their introduction into countries of the arctic zone—(*Hierochloa antarctica*, *H. submutica*, *Agrostis frigida*, *A. nivalis*, etc.) The vegetation of the Coborras Mountains does neither fully agree with that of Mount Buller, examined last year, nor

with the Alpine Flora of Van Diemen's Land; although the following series of its plants may indicate its partial identity with both:—*Ranunculus pimpinellifolius*, *R. scapiger*, *Geranium brevicaulis*, *Acacia bossiaoides*, *Hovea gelida*, *Oxylobium alpestre*, *Anisotome glacialis*, *Didiscus humilis*, *Celmisia astelifolia*, *Eurybia megalophylla*, *Brachycome nivalis*, *B. multicaulis*, *Otenosperma alpinum*, *Ozothamnus Hookeri*, *O. cinereus*, *Antennaria nubigena*, *Senecio pectinatus*, *Goodenia cordifolia*, *Gaultheria hispida*, *Leucopogon obtusatus*, *Lissanthe montana*, *Richea dracophylla*, *Prostanthera rotundifolia*, *Euphrasia alpina*, *Gentiana Diemensis*, *G. montana*, *Grevillea australis*, *Pimelea gracilis*, *Podocarpus montana*, *Exocarpus humifusa*, *Juncus falcatus*, *Restio australis*, *Oreobolus Pumilio*, *Lomaria alpina*, *Polytrichum dendroides*, etc. Here all these plants are alpine, notwithstanding some of them descend in Tasmania to the low land. But to those already known I had the gratification of adding several new species, probably peculiar to the Alpine Flora of Australia, namely:—*Phebalium phylicoides*, *Asterolasia trynalioides*, *Mnium singuliflorum*, *Bossia distichoclada*, *Centella cuneifolia*, *Anisotome simplicifolia*, *Eurybia alpicola*, *Ozothamnus planifolius*, *Gnaphalium alpinum*, *Hierochloa submutica*, *Glyceria Hookeriana*, *Agrostis gelida*, etc.

From the Coborras Mountains I continued travelling over a large tract of subalpine country in a north-easterly direction to the Snowy River, as far as the boundaries of New South Wales. Of several curious plants observed in the valleys of this stream, I ought to mention *Brachychiton populneum* (*Sterculia heterophylla*, *All. Cunn.*, not *Beauv.*), a beautiful tree from the tropics, growing with its turgid stem out of the bare granite rocks, washed by the tremendous floods of the melting snow. With many of its usual companions, it reaches here its most southerly limits. The seeds of this *Sterculia* were used for food in Dr. Leichhardt's expedition, and "produced not only a good beverage with an agreeable flavour, but also appeared to be very nourishing."

By a circuitous route along the Tambo to the south, and steering thence once more easterly, I reached, in the middle of March, the country beyond the mouth of the Snowy River, the most southerly locality in which Palms exist in the Australian Continent. The vegetation here assumes, at a latitude nearly equal to that of Melbourne, at 37° 30' S., entirely a tropical character, with its shady groves of trees producing dark horizontal foliage,—so rarely to be met with in

Australia,—with all those impenetrable and intricate masses of parasite and climbers overrunning the highest trees, and with so many typical forms never or but rarely seen beyond the torrid zone, unless when sheltered against the cold and under the favourable influence of the mild humid atmosphere of the coast tracts. The stately *Corypha* Palm, or *Livistonia australis*, one of the “princes of the vegetable world,” attains here the height of more than sixty feet, and may be deemed one of the most useful productions of our flora, furnishing in its young leafstalks and terminal bud the Palm Cabbage, a food equally wholesome and delicious, whilst the fan-shaped leaves are eagerly collected for the manufacture of hats. The occurrence of so many plants of a really tropical type, as *Cissus Australasica*, *Cocculus Harveyanus*, *Celastrus australis*, *Tristania laurina*, *Acmena floribunda*, *Morinda jasminoides*, *Tylophora barbata*, *Marsdenia rostrata*, *Smilax spinescens*, *Eustrephus latifolius*, etc., bears a sufficient testimony not only to the geniality of the climate, but also to the capability of the soil in this district. Transitions to the Flora of New South Wales were here perceptible everywhere.

After a short journey to the Buchan River, I returned home, in consequence of the early commencement of the rainy season, in the middle of April, having traversed the country in various directions to the extent of more than 2500 miles. How far the Flora of Victoria has been enriched during this journey, may be observed by referring to the annexed enumeration, which comprises, in addition to those plants brought forward in my last year's Report, 391 *Dicotyledoneæ* and 105 *Monocotyledoneæ*, of which nearly the fourth part was formerly unknown. Thus also 130 genera and 20 Natural Orders of Cotyledonous plants have been incorporated into our flora, one of the latter, *Menispermæ*, formerly foreign to Australia. Ten of the additional genera were also previously unknown in this part of the globe (*Myosurus*, *Cocculus*, *Hutchinsia*, *Annamia*, *Glinus*, *Celastrus*, *Centella*, *Erigeron*, *Antennaria*, *Udora*); whilst six others are either entirely new or hitherto undescribed (*Asterolasia*, *Halothamnus*, *Eriochiton*, *Osteocarpum*, *Juncella*, *Electrosperma*). Others again were previously thought to be confined to Van Diemen's Land, together with some here also indigenous Mammalia, amongst the latter the Tasmanian Hyæna (*Thylacinus cynocephalus*), and the Tiger-cat (*Dasyurus maculatus*).

The entire sum of species contained in the accompanying list, comprising, for the first time also, the lower Cryptogamic orders, amounts to 726, with 250 additional genera, by which the number of Victorian plants enumerated last year will be advanced to nearly 1700 really indigenous species, comprehending 680 genera and 134 Natural Orders,—numbers to be considered already as proportionately high for the extra-tropical latitudes and the area of this colony. It is probable that these comprise more than three-fourths of the indigenous plants, if we exclude Fungi, of which it is yet impossible to ascertain the number with any approach to correctness. In the compilation of that part of the catalogue which contains the lower *Acotyledoneæ*, I have enjoyed the services of some botanists of the highest rank, who made these branches of phytology their more exclusive study, and whose assistance I most gratefully record on this occasion. Messrs. Hampe and C. Müller performed the examination of the Mosses; Professor Al. Braun that of the *Characeæ*, and Dr. W. Sonder, for the greater part, that of the *Algæ*. I have further to acknowledge the aid which I experienced in the classification of others of these difficult plants from Professor Harvey, of King's College, Dublin, who intends to pursue his algological researches during this summer on our shores, and from whose long experience and extensive knowledge we may expect the most perfect elucidation of our Marine Flora.

The general proportions of Dicotyledonous plants to *Monocotyledoneæ* remain, by the additional species of this year, mainly unaltered, namely, about seven to two, as formerly stated, in the southern and south-eastern parts of the colony; although, by a decrease of *Monocotyledoneæ* in the north-western desert, an approach is perceptible there to that relation which these divisions of the vegetable kingdom bear to each other in Western Australia and in the sub-tropical part of South Australia. The series, however, of Natural Orders, with reference to their greatest number of species, received considerable alteration by the large increase of the *Compositæ* and several other orders in the desert tracts, and by the disappearance again, at various places, of other groups which predominated in the south. But, as nearly all the main localities have now been traversed, the series of the most prevailing Natural Orders may be at this time considered fixed for the whole colony, in the following arrangement, if we omit, as not yet sufficiently examined, the lower *Acotyledoneæ*, namely,—*Compositæ*; *Leguminosæ*,

Gramineæ, Myrtaceæ, Cyperoideæ, Salsolaceæ, Proteaceæ, Filices, Orchideæ, Epacrideæ, Diosmeæ, Umbelliferaæ, Liliaceæ, Labiataæ, Cruciferaæ, Goodeniaceæ, Scrophularinæ, Euphorbiaceæ.

Probably the descriptions of the new plants discovered last season will receive an abridged publication in the Transactions of the Philosophical Society or of the Melbourne Institute. Manuscripts have also been periodically transmitted to Sir William Hooker for his Journal, accompanied by corresponding specimens. All these scattered notes will be hereafter collected in a popular form for a Flora of Victoria.

Seeds of the indigenous plants have been gathered during my journey, when season and opportunity permitted, and not only for our own establishment, for they have been also distributed, to the amount of nearly 2000 lots, to the Royal Gardens at Kew, the Botanical Gardens of Hobart Town, Sydney, Cape of Good Hope, Mauritius, Calcutta, etc.

I beg to conclude these remarks with a few observations on the utility of such of our vegetable productions as were not alluded to in my last report.

The woods stand in this regard prominent in importance. The Blue Gum tree of Van Diemen's Land (*Eucalyptus globulus*) is found abundantly in some of the forest districts, principally of the south, and is already so well known for its colossal size, as to render it superfluous to quote the statements made of its vast dimensions. Of the circumference of the stem instances are on record, by which this tree ranks only second to the famous Boabob from the Senegal. The experiments instituted in Van Diemen's Land have shown "that its elasticity and strength exceed generally these of all woods hitherto tested;" "it is equal in durability to oak and superior to it in size;" and therefore highly esteemed for ship-building. Other *Eucalypti* likewise deserve attention, on account of the beauty and durability of their wood, in consequence of which qualities one of them, from the south-eastern frontiers, received there the name of the Mahogany tree. The wood of *Callistemon salignus*, although seldom of large dimensions, stands here, perhaps, unrivalled for hardness. The fragrant Myall wood, so well adapted for delicate ornamental work, is obtained from *Acacia homalophylla*, and some allied species in the Mallee desert. The well-known Blackwood (*Acacia melanoxylon*), in some localities called Lightwood, attains in the Fern-tree gullies an enormous size, and yields a splendid

material for furniture, at once most substantial, and capable of a high polish, being also recommended for the finishing work of vessels. The Myrtle tree of Sealer's Cove and the Snowy River (*Acmena floribunda*) is also remarkable for its straight growth and its excellent wood. The Australian evergreen Beech (*Fagus Cunninghami*) forms a noble tree, sometimes more than a hundred feet high, of which the wood takes a beautiful polish. Omitting such kinds as are more generally known, I may yet mention as useful, chiefly for ornamental work, the Sassafras wood (from *Atherosperma moschatum*), the Lomatia-wood (from *Lomatia polymorpha*), that of the Tolosa-tree (*Pittosporum bicolor*), the Musk-wood (from *Eurybia argophylla*), the Iron-wood (from *Notelæa ligustrina*), that of the Oil-fruit tree (*Elæocarpus cyaneus*), the Zieria-wood (from *Zieria arborescens*), that of the Heath-tree (*Monotoca elliptica*), and of the Australian Mulberry-tree (*Pseudomorus Australasica*). Samples of those kinds, which are met with on Wilson's Promontory, have been procured for the Paris Exhibition, and may give some additional proof that we possess woods here for any purpose, with the exception perhaps of such as are fit for larger ships' masts.

Many other plants of practical value were noticed during my last expedition, amongst them a kind of New Zealand Spinach (*Tetragonia inermis*); an undescribed Elder-tree (*Sambucus xanthocarpa*); a sort of Hottentot Fig (*Mesembryanthemum præcox*), from the Murray Desert, deserving cultivation for its agreeable fruit. To the series of native fruits enumerated last year might be further added *Nitraria Billardieri*, and several species of *Exocarpus*, *Leucopogon*, and *Lissanthe*. Under the name of Australian Sarsaparilla, either the stems of *Hardenbergia monophylla*, or of *Mühlenbeckia appressa* and *complexa*, are employed; whilst a plant closely allied to the American root (*Smilax spinescens*) remained hitherto unnoticed.

Turning, finally, to our future prospects, as afforded to us by the enjoyment of the serenest climate and by the extensive fertility of the soil, I venture to say, that no praise too high can be bestowed in a general view on the productiveness of our adopted country. We possess in the Southern hemisphere, what the ancients in the Northern called "regiones felices,"—those happy latitudes of a warm temperate zone, in which Nature with a prodigal hand offered prominently, amidst so many other gifts, the Cerealia, the Olive, and the Vine, and to which we there have added from the far East, the Orange, the Tea; from

India, the Rice; and from the New World, the Maize, Cassava, Arrow-root, Tobacco, and so many other treasures of the vegetable world, on which mankind now rely for luxury and support. All these may be here successfully produced along with those which we enjoyed in the country of our youth, and will, I trust, with the mighty resources of our mineral wealth, render this country one of the most delightful and prosperous of the globe.

BOTANICAL INFORMATION.

Extracts from the Jurors' Reports on some of the VEGETABLE PRODUCTS of the Madras Exhibition of 1855.

CANARA.

A very extensive collection of medicinal substances, illustrating the Native Pharmacopœia of Western India, has been forwarded by the Local Committee of Canara. This collection is not limited to indigenous products—it contains not a few articles imported from Arabia and elsewhere, which are often interesting, and their commercial routes are difficult to be traced, but with the majority of them we are already acquainted. The products, being of a perishable nature, did not all arrive in a state fit for examination, and considerable obscurity involves the history of some of them, but, as a whole, the collection exhibits well the condition of the Drug Bazaars in that province, and the nature of the traffic carried on with the Persian Gulf.

Amongst the Drugs we observe *Gamboge*, *Catechu*, *Dikkamully Gum*, *Cubebs*, *Colocynth*, *Assafœtida*, *Wood-oil (Dipterocarpus)*, *Cocculus cordifolius*, *Sphæranthus*?, *Plumbago Zeylanica*, *Acorus Calamus*, *Guilandina Bonduc*, *Argemone Mexicana*, *Cannabis Indica*, *Cyperus*?, *Cocum Butter*, and *Sago*.

The Canara Committee have evidently taken much trouble in preparing the above collection, and the Jury consider it worthy of honourable mention.

TRAVANCORE, MR. WARING.

The most valuable of drug collections, in regard to extent, variety, and the careful method in which they have been put up, is contributed by E. Waring, Esq., Residency Surgeon, Travancore, consisting of 241 spe-

cimens, accompanied with a descriptive catalogue of the drugs, and well dried specimens of the plants—the numbers being attached, corresponding with the vegetable products. This collection contains *Star Aniseed*, some remarkable *Galls*, *Wood*, *Aloes*, *Butea Kino*, *true Kino*, *Mutty Paul*, etc., also the root of a *Smilax*, which is reported to be a good substitute for Jamaica Sarsaparilla, *Cocculus Indicus*, *Nux vomica*, *Zedoaria*, etc., *Croton Tiglium*, *Aristolochia Indica*, *Curcuma*. The series is admirably arranged, and has been a source of much attraction during the Exhibition. The Jury awarded to Mr. Waring a First-class Medal.

MYSORE, DR. KIRKPATRICK.

The collection of medicines sent by Dr. Kirkpatrick, as part of the Mysore contribution, is very large and interesting. "In forming this collection" (243 specimens accompanied with drawings of some of the plants), Dr. Kirkpatrick writes:—"Care has been taken to include only such articles as there was reason to suppose were natural products of the Mysore Territories. Different preparations of several medicines, and a long list of medicinal substances procurable in the bazaars, have been excluded, because they were not products of Mysore." Amongst this collection, there are preparations of *Boel*, *Tylophora asthmatica*, *Wrightia antidysenterica*, *Celastrus nutans*, *Guilandina Bonduc*, *Cucumis Colocynthis*, etc., with practical comments upon their therapeutical value. For the reasons given in speaking of Mr. Waring's collection, and also on account of Dr. Kirkpatrick having submitted many of the substances to the test of actual hospital practice, the Jury award a First-class Medal.

MADURA.

A collection consisting of sixty-six specimens was forwarded by the Local Committee of Madura, containing some interesting drugs from the Pulney hills.

POODOOCOTTAH.

A small collection of drugs (forty-three specimens) was forwarded by H. E. the Tondiman Bahadoor of Poodoocottah. Many of the samples were unfortunately spoiled, being found covered with mould when the bags were opened.

The following articles of Indian *Materia Medica* deserve special notice:—

1. Oil of Lemon Grass, or Citronelle, the produce of *Andropogon citrorum*, is exhibited from Travancore, and also from Ceylon by Mrs. Goodsir.

2. Roussa-grass Oil, the produce of *Andropogon Calamus-aromaticus*, is exhibited from the Nizam's territories, by Dr. Riddel: this is found to be a good substitute for the more expensive Cajeput Oil, and is a useful rubefacient.

3. *Cardole*, a thick, black, oily substance, obtained from the pericarp of *Anacardium occidentale*, the Cashew Nut, is exhibited from Tanjore (Local Committee), and by Lieutenant Hawkes. It is a powerful vesicating agent.

4. *Borneo Camphor*, the produce of *Dryobalanops Camphora*: a small quantity was brought over from Labuan, as a curiosity, by Second Dresser Pulnyandy.

5. *Country Sarsaparilla*, the roots of *Hemidesmus Indicus*, have been sent from almost every district, but they vary considerably in aroma, the bundle from Trichinopoly being the best.

Syrup and extract from the indigenous plant growing at the foot of Courtallum Hills, by First Dresser C. Appavoo Pillay, Tinnevely.

Dr. A. J. Scott has forwarded a crystallized principle, called "*Hemidesmine*," which is found on examination to be an entirely new substance, exhibiting a remarkable indifference both to acids and alkalies, crystallizing in a peculiar manner in hexagonal plates, which are subject to rapid efflorescence. The only ascertained solvents are alcohol and ether; it is perfectly insoluble in water, both cold and hot. These facts show that it is a substance of a very peculiar nature. The Jury recommend that this preparation be fully tested in hospital practice, along with the extract and syrup prepared from the same plant, and forwarded by First Dresser C. Appavoo Pillay. In consideration of Hemidesmine being a new product, the Jury award a First-class Medal to Dr. Scott, and to C. Appavoo Pillay honourable mention.

The late Mr. Gay's specimens of various pharmaceutical preparations, including *Omum Water*, *Crystallized Sugar of Omum*, *Wine of Sarsaparilla*, *Essence of Sarsaparilla*, and *Croton Oil*, are considered creditable, and deserving of notice.

(To be continued.)

Plants of MADEIRA, etc.

Mr. Nathaniel H. Mason has issued the following circular among his friends and the scientific public:—

“I beg leave to inform you that I am about to visit the Azores, Madeira, and the Canary Islands, for the purposes of scientific research. I shall collect Plants, Insects, and Shells, and objects of Natural History generally, and shall be glad to execute any commissions, either for living plants (especially Ferns) to be sent to England in Ward’s Cases, or for dried collections.

“I am well acquainted with Madeira, having resided for two years in the Island, and I have also visited Teneriffe. I have had considerable experience in collecting and preserving plants, as it has been a favourite pursuit of mine for several years, so that I can promise that all specimens shall be of the most perfect character and preserved in the most careful manner.

“Should you (or any friend) wish to avail yourself of this opportunity, I shall be happy to offer satisfactory references, as I am personally unknown to you. I may, however, mention the Firm in which my father is a partner, viz. Messrs. Bridges, Mason, and Bridges, solicitors, Red Lion Square. My terms for dried plants would be £2 per hundred, and with regard to other objects I should be open to any fair arrangement. I shall be happy to furnish you with any further particulars of my plans you may desire, and trust you will excuse my taking the liberty of bringing them under your notice.

“May I beg the favour of an early answer, as I am anxious to start as soon as possible, having numerous commissions from botanists and men of science? I take out a dredging apparatus for Shells and Zoophytes.

“I have the honour to be, etc.,

“NATHL. H. MASON.

“17, Compton Terrace, Islington, Aug. 27, 1855.”

In addition to the above, we may give the following testimonial in his favour, from the pen of Dr. Lindley:—

“Mr. Mason is well acquainted with Madeira, having resided for two years in the Island, and has also visited Teneriffe. We have had an opportunity of seeing some of his dried plants; and it is not too much to say that they are among the finest that have ever been prepared; not surpassed by even those of Bourgeau.

“We have no doubt so favourable an opportunity of procuring

Madeira plants, especially the numerous beautiful species of Fern, will be gladly seized by our horticultural friends, who can communicate their wishes to Mr. Mason."

We cannot but wish him every success.

NOTICES OF BOOKS.

LOWE, E. J., Esq., etc.: *A Natural History of FERNS, British and Exotic, with coloured Illustrations.* 8vo. London. 1855. Parts I. to IV.

Ferns are becoming universal favourites, both with cultivators of plants and collectors of specimens; and few, if any of the tribes, in the whole vegetable creation, can be more lovely or more graceful in form and colour, delicacy of texture, and elegant ramification. The present work, though not so indicated in the title-page, is surely mainly intended for the former class of persons, namely cultivators; for we find it stated in the address, or advertisement, that "the drawings will be chiefly taken from living specimens in the author's own collection." And even if he has not overrated that collection at "500 good species," yet that is but a comparatively small portion of "British and Exotic Ferns." We come, however, to an approximation of the amount of species to be included in the work in another announcement in No. III., where it is stated that the work will consist of seven volumes, and each volume will have 75 coloured illustrations; and as there is rarely more than one species on a plate, the amount will not much exceed the number cultivated by Mr. Lowe. "It is also intended to add a new feature to the work, by furnishing a list of the parties who can supply plants of the species." We have then eminently a gardener's and a nurseryman's book, rather than a work destined for the botanist or the scientific student of Ferns; and to this no one could offer any objection, if only so indicated in the title. Nay, we think that to have so done would render it more attractive, for many would be dismayed at the idea of purchasing coloured figures of all the known British and Exotic Ferns. The work is got up in a pretty form, good paper, neat type; figures engraved and coloured; fair representatives of the species intended, but sadly defective in artistic execution, the graceful curvature and varied colouring being quite neglected; so that on looking at *Nothochlæna nivea*, for example,

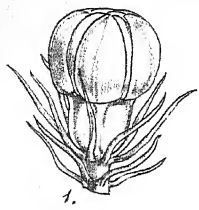
you see a flattened specimen with an entirely white under surface, or at *Gymnogramma chrysophylla*, and you see an entirely plain yellow surface. Root and caudex are never represented; nor any magnified portion either of the frond or fructification, both often quite necessary for comprehending the "Natural History of the species." There is indeed, in all cases, at the head of each description, a woodcut, representing a portion of the species, and so superior in point of execution that we could have wished the author had confined himself to them. Many cultivators and nurserymen, no doubt, think differently, and no one can complain of the price, 1s., for four such coloured plates, as many woodcuts, and four leaves of descriptive matter. The latter is not indicative of one practised in botanical writing; but a little care and attention, and following a good pattern, would enable the author to avoid errors committed in the numbers now before us, and he seems to have addressed himself to the task without sufficient preparation. At the very first page, *Gymnogramma* (a genus) is called "Tribe 1." *Gymnogramma* itself, we suspect, should be *Gymnogramme* (γυμνος, naked, and γραμμή, a line—not "γράμμα, writing"). *G. tartarea*: this word means tartareous (not "infernal"). The yellow *Gymnogrammes* are not satisfactorily distinguished botanically, and there is no attempt at any specific character, as in all botanical works of modern times. *Gymnogramme rufa* and *G. tomentosa* are mere varieties of each other, as is seen in any good Herbarium collection (in which probably Mr. Lowe is deficient), where all intermediate forms may be observed; yet the description does not hint at their close affinity. In the same way *Nothochlæna crassifolia*, "Moore and Houlston," is a mere form of *N. trichomanoides*; and we hope, as it is "not yet included in any of the Nurserymen's Catalogues," that it never will be. Nurserymen's catalogues are a great deal too full already. Under both these plants the term "caudate," applied to the base of the pinnae, is written for *cordate*. No synonymy is ever given;—by synonymy we mean reference to authors' works where they are previously described. There is a list of authors' names indeed, often calculated to mislead. Take *Adiantum concinnum*, for example, where such reference is the more required, because there is not one word of description by which this very distinct species may be recognized. After its name we find "Hooker, Humboldt, Presl, Bonpland, Link, Willdenow, Moore and Houlston, Kunth (Kunze? or should not Humboldt, Bonpland, and Kunth be brought together, as the authors of one work—H. B. K.? etc.).

Now "Hooker," following immediately on the name of the plant, would lead to the inference that he was the author of the name, and not H. B. K., with whom however it originated. Again, under the same plant, "*Adiantum cuneatum*, Hook.;" this should be Hook. fil. In quoting M. Fée, the accent is invariably omitted. Cavanilles is written Cavanelles. These errors are pointed out in no hostile spirit. The author has much before him; and the work is capable of great improvement, which we believe an educated gentleman like Mr. Lowe is quite capable of effecting, and of thus rendering his book, which is really undertaken with the best of motives, and from no love or expectation of lucre, really useful to horticulturists and lovers of Ferns.

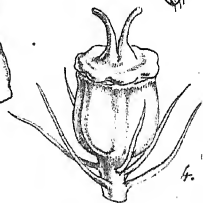
MOORE, THOMAS, F.L.S.: *The FERNS of Great Britain and Ireland*; edited by JOHN LINDLEY, Ph. D., F.R.S., etc. Imp. folio. Part VI. Nature-printed by Henry Bradbury. London. 1855.

This fine work is continued with great regularity. The sixth Fasciculus is now before us, containing Tab. 18, *Lastrea rigida*, with its numerous synonyms; for, though a rare plant in Britain, it is not unfrequent in the middle and south of Europe, extending to Asia Minor and to Siberia. The *Aspidium argutum* of Kaulfuss, from California, is pronounced to be the same, and it is a native of Massachusetts, on the east side of North America.

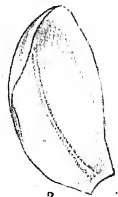
Tab. 19 admirably represents the normal state of *Lastrea cristata*; Tab. 20 the var. *uliginosa* (*Lophodium uliginosum*, Newm.) from Oxtou Bog, Nottinghamshire. The two left-hand figures are derived from authentic specimens, which were communicated to the authors of the 'British Flora,' and which they also refer to a state with broader and more deeply-divided fronds, of *Aspidium* (or *Lastrea*) *cristatum*, in the seventh edition. The right-hand figure in the plate, however, has a very different aspect; and, unless ascertained that it is derived from one and the same root with the left-hand specimens, would seem to deserve to be noticed as a third variety; or possibly it may be a separate species, and one of the states of *Asp. spinulosum*, as defined by Hooker and Arnott. In outline it resembles the *A. cristatum*, in composition the *A. spinulosum*. We shall be glad to see how Mr. Moore will treat his *Lastrea spinulosa*, which is here indicated "Var. *spinulosa*" under *L. cristata*, but reference is made to *L. spinulosa* (Plate XXI.) as a distinct species.



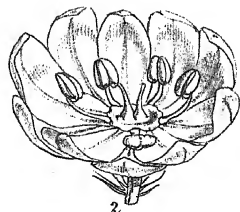
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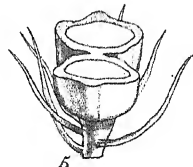
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6.

Observations on GLEICHENIACEÆ and CYATHEÆ of Java; by MR. J. K. HASSKARL: communicated in a Letter from Java, dated July, 1855.

Mr. Hasskarl,* the able author of the 'Catalogus Plantarum in Horto Botanico Bogoriensi cultarum,' of the 'Plantæ Javanicæ Rariores,' and several other botanical works, is now stationed at Preange, in Java, at the very base of the famous mountain Gedeh, where he is prosecuting his botanical researches with great zeal, and is paying particular attention to, and fully describing, the various Ferns of that fertile island. He has been good enough to communicate to me the following notes on those genera and species which have first engaged his attention: and he has there the inestimable advantage of studying the most difficult genera with the living plants before him; so that his remarks on the *Cyathea* owe much of their value to this circumstance. He has kindly promised, previous to publishing on a more extended scale, to communicate some notes on the *Dicksonia*, *Hymenophyllea*, and *Davallia*, which will be most welcome to all students of Ferns.—
ED.

Preange (Island of Java), July 25, 1855.

I shall beg to relate to you some of my remarks on the Ferns: the full descriptions of the plants I shall send to you when they are printed, which I hope soon will be the case by the Batavian part of the Natural Society for the Dutch East Indies.

Firstly, I will express my opinion that *Gleichenia* and *Mertensia* ought to form different genera; the similarity of habit cannot, I believe, be sufficient reason to unite them, the insertion of the sori being very different, as you have indicated at page 2, Subgen. I. and Subgen. II. of the Spec. Fil.; but the name of *Mertensia*, Willd., cannot be retained, in consequence of *Mertensia*, Roth (DC. Prodr. x. 84), being of older date than that of Willdenow.

Gleichenia vulcanica, Bl., seems to me not truly to be different from *G. alpina*, Roth; the marks of distinction given by Mr. Blume by no means correspond with his plant, for the rachis is as much clothed with imbricated scales as with (tomentum) down. Kunze, in his Suppl. to Schkuhr's Ferns, i. 162, observes that his *G. Boryi* bears some likeness in the habit with the *G. vulcanica*, Bl., or, at least, what he had received

* This gentleman had recently the misfortune to lose not only his books, but his entire family, wife and four children, by shipwreck, on the coast of Holland, which they were just leaving to join Mr. Hasskarl in Java.

for it, but I cannot agree therewith. The *G. vulcanica* is most surely dichotomous, and the pinnæ likewise.

Gleichenia longissima, Bl., belongs not to the *Eugleicheniæ*, but to the *Mertensia*, and is so nearly related to *G. excelsa*, J. Sm., that I almost doubt if the latter should remain separated. The second variety of *G. longissima*, Bl., ought to form a new species, which I had called in manuscript *Mertensia arachnoides*, Hsskl.; gigantea, pinnis oppositis elongato-sublineari-oblongis, rhachi complanata emarginata dense canotomentosa et hinc inde et præprimis subtus paleis minutis adpressis munita, pinnulis lineari-lanceolatis acuminatis tunc subfalcatis alternis profunde pinnatifidis coriaceis subtus glaucis, utrinque præprimis autem subtus arachnoideo-ferrugineo-lanuginosis supra mox glabratis nitidis subtus dein subglabratis, laciniis margine cristæformi costæ solummodo junctis linearibus obtusis vix acutiusculis, margine integerrimo revolutis, venis furcatis, soris superficialibus crebris e sporangiis 1-4 conformatis.—(Stipites $6\frac{1}{2}$ ped. alt.; frondes incomplete evolutæ 4 pinnas solummodo gerentes, 6 ped. longæ, 3-3 $\frac{1}{2}$ ped. latæ; pinna 2 ped. longa, fere 1 ped. lata.)

Cyathea arborea, Sm., the essential character of which, you observe, may be looked for in the firm texture and beautiful regular margin of the cup-shaped involucre or age; grows also on the declivity of the Gedeh and Lawu, at the height of 5000 feet. Justly you have united the *Disphenia* with the *Cyathea*, and I wonder that Kunze, in Zollinger Verz. Herb. No. 2538, has revived that genus, making of this plant the *Disphenia orientalis*. I am in possession of a specimen of Zollinger, signed by his hand "*Cyathea crenulata*," a quite different species. Of this and the other arboreal Ferns I have preserved the whole plant, being for the most part of them in possession of complete fructiferous fronds and stems, which I could investigate in a fresh state.

To *C. spinulosa*, Wall., I must refer a variety β , *muriculata*, rhachi et stipitis apice muriculatis (nec spinulosis); here too belongs *C. polycarpa*, Jungh., α , *elongata*, Jungh. Flora, 1847, p. 522..

C. oinops, Hsskl.; arborea, alta, stipitibus brevibus punctulato-asperis basi paleaceis cæterum cum rhachi tomento vineo denso stellato tectis subteretibus supra sulcatis castaneis, fronde ovali-elliptica utrinque acuta coriacea tripinnatifida, pinnis oblongis acutis, pinnulis lineari-oblongis acutis profunde (ad apicem sterilem et sterilibus minus profunde) crenato-serratis, margine revolutis, supra e venis furcatis, basin

versus nunc bifurcatis sulcatis subbullatis, subtus concavis rigidis; soris copiosis ferrugineo-fuscis in lacinia quaque 12–16 biseriatis venarum alis insertis grandibus densis, dein confluentibus, totas fere lacinias apice excepto occupantibus; *indusio* tenerrimo primo cupulæformi membranaceo, mox bifido et laceratim evanido; rhachibus secundariis et costis costulisque dense *vineo*-tomentosis et paleis ferrugineis nitidulis obtectis.—This species has some affinity to *C. crenulata*, Bl., but differs from it: lacinii acutioribus profunde crenato-serratis, supra bullatis rigidioribus, tomento vineo rachium et præprimis sororum copiosorum *indusio* tenuissimo membranaceo, dein subevanido. Stem 40 feet high. This Fern grows at the height of 8000 feet on the Gedeh.

C. leukophaës, Hsskl.; arborea (10–15'), stipite rhachique muriculato-aculeatis, fronde tripinnatifida coriacea *siccando supra candida* glabra; pinnis oblongo-lanceolatis acuminatis plerumque petiolatis, pinnulis lineari-oblongis acuminatis basi inæqualiter truncatis valde profunde pinnatifidis, lacinii lineari-oblongis acutis margine ad apicem serrato-crenatis reflexis, venis pinnatis furcatis, soris ad alam venarum insertis globosis, *indusio* membranaceo lucidulo globoso mox irregulariter lacero et dein toto evanido.—Mr. Teysmann, who superintends the Botanic Garden of Buitenzorg, found this Fern on the Dileng mountains. Differt a *C. dealbata*, Sw.: stipite rhachique haud tomentosa aculeatis, pinnulis subtus haud glaucis, lacinii linearibus nec oblongis, soris fere totis obtectis, basi *indusii* haud pateræformi remanenti, fronde coriacea;—a *C. medullari*, Sw., diff. pinnulis haud lato-lanceolatis epaleaceis, lacinii acutis et aculeis stipitis et rhacheos haud luridis;—a *C. crenulata*, Bl., diff. stipite et rhachi muriculatis, pinnulis lineari-oblongis, rhachi et costa glabris, lacinii ad apicem crenatis.

Now I proceed to *Alsophila*, and I shall begin with the *A. contaminans*, Wall. From this species I distinguish five forms or varieties, some of which I in the first instance regarded as new species; but having found the intermediate links, I think it better not to augment too much the new species. It will I think be necessary to give a new diagnosis of the species, that thereby may be included the said varieties also. I propose the following one:—Arborea, trunco medulla alba crassa pleno et stipitibus basi dense paleaceis cum rhachi primaria et secundariis valde armatis; frondibus 2–3-pinnatis subtus glaucis præter rhaches secundarias et costas supra tomentellis glabris; pinnis oblongis acutis, pinnulis oblongo-lanceolatis subulatis profunde pinna-

tifidis, basi plerumque pinnatis, laciniis (aut pinnulis secundariis) linear-oblongis acutis aut acuminatis, ad pinnarum apices oblongis acutis aut obtusiusculis, margine subreflexo obsolete crenulato, ad costam costulasque subtus squamulis bullatis fimbriatis minutis caducis aut tenuibus elongatis setulosis plus minus persistentibus obsitis, dein sæpe nudis; soris venis plerumque 2-3-furcatis, ad apicem laciniarum simpliciter furcatis ad alas insertis, in lacinia quaque 2-serratis, easque supra medium aut basi solummodo rarius ad apicem usque obtegentibus; involuero tenuissimo arachnoideo, mox evanido lacerato; receptaculo globoso piloso.—Var. *α*, *robusta*, Hsskl., is the form which abounds in the lower situations, from 3000 to 4500 feet; the stem arrives only to a height of 15-20 feet, but is on the top nearly a foot thick; the fronds are 9-9½ feet long, and in the midst 5 feet broad; the scales are few, small, and deciduous.—Var. *β*, *squamulata*, H., growing at the height of 8000 feet, the stem 45 feet high, on the top only 5½ inches thick; the laciniae (I found this one only sterile!) subintegerrimæ obtusæ rarius acutiusculæ, costis costulisque utrinque præprimis autem subtus dense paleaceis; the scales are somewhat larger than that of *α*.—Var. *γ*, *densa*, Hsskl.; the stem is 40 feet high; the laciniae are oblongæ, sublineari-oblongæ, falcatæ acutiusculæ aut obtusæ, steriles paulo latiores, costulæ utrinque glabræ, squamulis bullatis raris; soris densis confluentibus, fere totas lacinias obtegentibus. This one grows at a height of 4500-5000 feet.—Var. *δ*, *mikrolobos*, Hsskl.; pinnis pinnulisque raris distantibus elongatis, laciniis parvis subintegerrimis acutis, antecedentis fere dimidio brevioribus. The stem is 40 feet high, the fronds very small, and few. This I found near the warm cataracts of the Gedeh; perhaps only a very old state of one of the former varieties.—Var. *ε*, *setulosa*, Hsskl.; laciniae elongatæ pinnis raris parvis (2½ feet long, not quite 1 foot broad), costis costulisque subtus paleis setulosis sat longis albidis patentibus præprimis in partibus sterilibus obsessæ; the trunk high, and the stipites are almost verticillate, eight growing together at the same height. In consequence of the copious medullary substance, principally in the larger, or rather thicker stems, like the *α*, I had called it formerly *A. myelopoios*, but I think it better not to separate it from the *A. contaminans*, Wall. I have another *Alsophila*, which I cannot separate from the *caudata*, Sm., but you call that species *inermis*, while my one has the stipes *muricated*; perhaps your specimens are only pinnæ or the top of fronds, where the

murices are not to be found; all the remaining signs are consistent with your description. *A. extensa*, R. Br., you have put under *Cyathea medullaris*; the *Alsophila* which Bl. En. 246, has designed by this name, is surely an *Alsophila*; there is no rudiment of indusium to be seen.

A. melanopus, Hsskl.; arborea (10–15 feet high), stipitibus basi valde aculeatis, apice cum rhachi submuticis asperulis, frondibus 3 pinnatifidis ovato-oblongis acutis membranaceis subtus leviter glaucescentibus, pinnis elongato-oblongis acutis aut oblongo-lanceolatis acuminatis, pinnulis lineari-oblongis acuminatis profunde pinnatifidis, laciniis lineari-oblongis obtusis aut acutiusculis subfalcatis planis obsolete crenato-serratis, soris alis venarum furcatarum insertis, costulis approximatis $\frac{1}{2}$ – $\frac{3}{4}$ laciniarum obtegentibus dein confluentibus; rhachi subtragona glabriuscula inermi, paleis minutis subtus ad costulas caducissimis, ad apicem trunci et basin stipitum nigrescentibus grandibus copiosis dein deciduis.—This Fern, which grows at the height of between 4–8000 feet in the woods of the Gedeh, differs from *A. lepi-feræ*, J. Sm., stipite inermi, rhachi punctata aspera supra pilis longis adpressis vestita, pinnulis longiter subulatis paleis crinitis paucis. Your *A. crinita*, fronde coriacea, rhachi paleaceo-crinita, supra undique pilosa, laciniis anguste ovato-oblongis margine reflexo subtus in costulis venisque pilosis, soris paleis crinitis tectis, differs from *A. excelsa*, R. Br., laciniis acute serratis margine reflexis, inferioribus subauriculatis venis 2–3-furcatis;—from *A. gigantea*, Wall., defectu aculeorum, trunco altiori, pinnis ovato-lanceolatis opacis, pinnulis oblongo-lanceolatis laciniis ovatis, rhachi strigosa, venis simplicibus, receptaculo calvo, soris in medio inter costas marginesque.

The diagnosis of *A. (Chnoophora, Bl.) tomentosa*, Endl., is not sufficient; here I offer a new one:—Arborea (25 feet high), stipite rhachique supra lanato-tomentosa et subtus dense paleacea muricato-aculeatis, frondibus ovatis tripinnatifidis aut triplicato-pinnatis coriaceis supra glabris, subtus cum rhachibus secundariis præprimis autem in costis costulisque dense fulvo-lanato-tomentosis et paleis imbricatis longissimis adpressis densissime obtectis, pinnulis lineari-lanceolatis acuminatissimis, laciniis (aut pinnulis secundariis) linearibus obtusis subfalcatis crenulatis, sed margine revoluto quasi integerrimis et acutis, venis 2–3-furcatis, soris inter paleas et tomentum costæ et costularum plane occultis.—I am not quite sure if this will not prove your *A. crinita*, but the laciniæ of this are ovate-oblong, very *tomentose*, linear!—And lastly, I have

A. Hænkei, Prsl., I believe, but am not quite sure, if this species truly belongs to my plant: if so, it is a variety, which I called β , *angustata*; pinnulis angustioribus acuminatissimis, ad apicem pinnarum extrorsum subfalcatis, ad basin costarum adpresse paleaceis, costis steriliis et costulis paleis parvis bullatis obtectis.—I believe that the *Chnoophora lurida* of Bl. will belong to this species, but, by the shortness of the diagnoses, there can be only a guess at it.

GLEICHENIÆ.

1. *Gleichenia vulcanica*, Bl.
2. *Mertensia gigant.*, Prsl. β , *glauca*, Hsk.
3. „ *excelsa*, Hsskl.
4. „ *longissima*, Kunze.
5. „ *arachnoides*, Hsskl.
6. „ *bifurcata*, Kunze.
7. „ *dichot.*, Willd., α , *rigida*, Bl.
8. „ β , *elongata*, Zoll.
9. „ γ , *venosa*, Bl.
10. „ δ , *tenera*, Bl.
11. „ ϵ , *pubigera*, Bl.
12. „ *vestita*, Kunze.
13. „ α , *elongata*, Zoll.

CYATHEÆ.

14. *Cyathea arborea*, Sm., β , *pallida*.
15. „ *Javanica*, Bl.
16. „ *spinulosa*, Wall.
17. „ β , *muriculata*, Hsskl.

18. *Cyathea crenulata*, Bl.

19. „ *oinops*, Hsskl.
20. „ *leukophaïs*, Hsskl.
21. „ *Walkeræ*, Hook.
22. „ *medul.*, Sw., γ , *tripinnata*, Hk.
23. *Alsophila glabra*, Hook.
24. „ *contaminans*, Wall., α , *robusta*, Hsskl.
25. „ β , *squamulata*, Hsskl.
26. „ γ , *densa*, Hsskl.
27. „ δ , *mikrolobus*, Hsskl.
28. „ ϵ , *setulosa*, Hsskl.
29. „ *caudata*, Sm.
30. „ *extensa*, Bl.
31. „ *melanopus*, Hsskl.
32. „ *gigantea*, Wall.
33. „ *comosa*, Wall.
34. „ *tomentosa*, Endl.
35. „ *Hænkei*, Prsl., β , *angustata*, Hsskl.

Botanical Notices on a Journey into the Interior of SOUTHERN AFRICA, in company with Mr. Burke; by CHARLES L. ZEYHER.

(Continued from p. 344 of Vol. V. of the London Journal of Botany.)

The country over which we travelled the first day of the breaking up of our encampment, had an undulated form, similar to the large tract over which we had travelled since we left the Orange River, of a grass-like vegetation; but, as the dry season had set in already, had lost its luxuriance and look of freshness of former months. We steered for the whole afternoon over a trackless wilderness, inhabited only by thousands of various kinds of game, and halted on an elevated spot for the

night, from whence the course of the Sand River could be seen already at a considerable distance, running below in a W.N.W. direction through a wide valley of green meadows, the end of which was seemingly limited to our sight by the vapours of a far-distant gloomy horizon. We rambled about during the limited space of daylight towards sunset, in search of botanical objects about the spot of our night-quarters; the field was however very much exhausted of its vegetable growth, by the great number of various kinds of game on the hills in every direction, so that it was difficult to find suitable specimens of plants; the only thing worth mentioning was a kind of *Polygonum*, No. 1452, an aquatic plant, growing in periodical pools of water; its purple-looking flower-spikes rising over the surface of the water, giving a cheerful look to those little ponds; flowering specimens of *Limosella*, likewise aquatic plants, were growing on the banks of these water-pools. We started early the next morning; our course was descending for several miles before we reached the banks of the Sand River, which we found exceedingly difficult in fording, on account of its steep banks and the great masses of drifting sand; our teams had a hard pull to extricate the waggons, and to bring them on the opposite banks. Although there was now only a small stream of water running in its channel, the high and abruptly-broken steep banks of that river showed evidently that at some periods it had been a formidable gulf, and a barrier arresting the proceedings of travellers, admitting neither fording with waggons nor on horseback. As there is scarcely any kind of trees to be seen, its banks have a dreary appearance in comparison to many other rivers in South Africa. Close on its abrupt sides were just flowering the prickly shrub of *Melolobium calycinum*, Benth., No. 394, and *Oxygonum*? No. 1451, an annual creeper. The right bank of the Sand River about here, where we forded it, is girded for a considerable length by moderate hills, which we ascended, and afterwards made our way over a tolerably level table-land; the north-westerly limits we reached towards evening, when we descended again, and took our night-quarters near to the temporary mansion of an emigrant family, which we left the next morning, and shaped our course in a north-westerly direction towards an obtuse conical hill, rising over the elevated ridge of a plain, being a table-land, and lying between the Sand River and the Falsrivier. The emigrants baptized this hill again "Dornkop," on account of its woody appearance, standing quite iso-

lated amidst extensive grassy plains, having, for the most part, thorny Acacias amongst its arborescent vegetation, and as there is mention made already of a similar hill bearing that name, they may be mistaken sometimes one for the other. We passed, only a short distance from that hill, on our way towards the Bloemspruit, a tributary of the Falsrivier, and halted over-night on a spot at no great distance from the first-mentioned river, which we beheld on our right side the following day, joining it for a while over a fertile-looking, extensive valley, in which many of the emigrants had pitched their tents as a temporary residence, many of whom we passed that day. The zoological collection became increased by several kinds of birds, belonging to the genus *Cursorius*, resembling much in habit and form the true *Otis*, but much smaller, occurring chiefly upon kurroo-like places; they seem to feed upon insects, especially upon ants and smaller kinds of beetles.

The vegetation along the valley of the Bloemspruit has a different appearance to those tracts we had hitherto seen before, and seemed very wholesome for cattle and sheep, and also well adapted for gardening and agriculture, the advantage of which attracted and persuaded the farmers to remain here. We reached, towards evening, several families of emigrants, whose houses were built of stronger materials, close to the junction of the Bloemspruit with the Falsrivier. One of the inhabitants here, a Mr. Styn, kept the civil function as a field-cornet over the emigrants, who lived here about; they were very kind towards us, and we remained here for several days, as the rivers were unpassable, caused by some heavy thunder-showers.

The tops of many of the surrounding hills, dispersed in that moderately extended valley, were crowned with various kinds of trees, giving a lively and pleasant appearance to the surrounding country, compared with the vast and dreary regions lying in the rear of us. The contrast was striking, to witness the influence of a sheltered situation in an elevated country like this, with much vegetation. The winter season had commenced already, and was felt very sensibly during night on the more elevated regions. The climate in the more depressed valley here was comparatively milder, and very favourable to the existence of the perfect dicotyledonous orders of plants.

The channel of the Falsrivier, towards the junction with the Bloemspruit, lies more than a hundred feet deep, between narrow banks, barely wooded with shrubs, and although a considerable distance from

any deep running large river, there were fresh tracks of numerous otters impressed on its sandy banks.

We forded the Falsrivier only a few hundred yards' distance from our last station, the drift being very rocky and bad, although considerably wider than the Bloemspuit; and the waggons were put to trial of their strength on that difficult pass. Having crossed both rivers safely, we steered towards an elevated grassy plain, of a uniform aspect, like others which we had passed before; its lonesomeness being broken only by the multitudes of game, as on the plains between the Sand River and the Bloemspuit. Although it is dangerous in these quarters to travel during dark, on account of the lions, which are numerous everywhere where there is plenty of game, we were obliged to do so, as we wished to halt during the night near some water. Listening, as we went on, to the croaking noise of frogs, as an indication of fresh water, for which purpose they are very useful to travellers in these strange regions, by telling with their voices during the night where to find that liquid they long for, we had the satisfaction of being conducted by their far-sounding yells to some pools of fresh water. During the time that we unyoked our teams we were welcomed by a pair of young dogs: our hope was that they belonged to somebody not far from us, but the question was shortly resolved, when we found that their owner, who had spanned out at the same spot the same day, or the day before, had left the poor animals behind when he started, and mercilessly given them over to their fate. It was fortunate for them that we arrived, as there would be very little chance for them to escape destruction during the night, by the teeth of the spotted hyænas, who were very numerous about here, and are very fond of the flesh of the canine race. It is known to most of the Cape colonists, in order to be sure of killing hyænas, that they sacrifice a dog as a bait, by fixing him on a spring-gun; a mode by which the farmers not seldom destroy the enemy of their flock.

We took the two little orphans with us the next morning when we started, and reared them up; they became very useful companions afterwards, being watchful sentries during the night, and amply repaid the pains we took to carry them with us during the first few weeks. The route we travelled led us over a low tract of ground, evidently liable to be inundated to some extent during the rainy season, being

inhabited by many kinds of water-birds; likewise several sorts of herons; and, amongst others, the *Ibis religiosa* of the ancients, occurring only in Saldanha Bay, of the Cape Colony: we were so fortunate as to get several fine specimens of this bird when we passed that swampy spot. We beheld the Rhinosterkop in front, soon reached it, and as there was an abundance of wood, we were persuaded to remain here; however fresh water was scarce.

This remarkable hill is crowned, like the Dornkop, and others which we had already passed, with various kinds of forest-trees, raising their wooded heads high over the far-extended plain, seemingly only limited by the horizon. It appears, when seen from a considerable distance, like a tropical island, surrounded by a vast ocean. The frequency of a delusive mirage, completely concealing the ground for awhile, makes the deception complete; and as these vapours of the atmosphere are vibrating through the influence of heat, the undulating motion gives a perfect idea of a wavy deep; whirlwinds, frequently raising columns of dust into the air, resemble the spouting of whales, so that nothing is wanted to a perfect delusion.

The trees of *Acacia robusta*, Burch., constitute some part of the wood on that hill; it was the first time we observed that kind of tree since our journey. The *Acacia Capensis* and *A. Caffra*, although not rare here, had their station more towards the foot of the hill, and extended even for some distance over a level ground. The tall flower-stalks, clothed with many bright reddish flowers, of *Kalanchoe alternans*, Pers., n. 670, belonging to the Natural Order *Crassulaceæ*, frequently ornamented the rocks on open places where the beams of the sun could touch them.

The accident, that one of the best horses died here, quite unexpectedly, alarmed us much, after having sacrificed much time already at Dornkop, waiting for the commencement of the healthy season for horses: the distemper attacked the animal so suddenly that it was on the eve of dying before we perceived that it was sick. It was serious to consider that all the horses we had with us might die before they were of any use to us. It was a sufficient proof how difficult it is to prognosticate the exact time when that fatal visitation commences and when it ends; as its progress is often so sudden, that in less than one hour a healthy animal may become a lifeless carcase. The loss was great, being deprived already of one of the best horses, which was destined for catching

young antelopes. It was however not practicable now to return several days' journey, in order to purchase fresh horses; and having no alternative, we left our station, the Rhinosterkop, again, and proceeded in a northerly direction towards the Rhinoster River, as being the nearest station now in advance of us.

Travelling over a level country, of a grass-like vegetation, for a considerable length, we beheld northwards in front of us a chain of detached mountains, rising, as we went on, successively higher above the northern horizon, till we arrived near the banks of the Nama Hari of Captain Harris's map, or the Rhinoster River of the emigrants, having travelled fifteen miles that afternoon. We beheld those mountains still in front just opposite the river, where we halted that night.

The Rhinoster River runs in a very deep and narrow bed, being fringed below in its channel by venerable trees of the fine *Salix Gariiepina*, Burch., or Willow of the Orange River; but on account of the banks being steep and high, the top of those trees scarcely raise their head above the level of the valley through which that river has cut its deep course. Its crystal, clear, and constant running stream, during the dry season, is a proof that it comes from a far distance; most likely its sources are in the much elevated north-westerly ridges of the Drakasbergen.

It was difficult the next day to find a suitable drift for fording that river, as its deep and narrow bed continues for miles, similar to that of the Caledon River. Having travelled for a considerable length down, along the left side of that river, we came to a suitable place, where we safely passed to the opposite side. During the time that we forded the stream, our dogs took pleasure in starting coveys of pheasants (*Francolinus Swainsonii*, Sm.) out of the bushes along the banks of the river. They were abundant here, and we shot several of them. However, one of our dogs, who continued barking, made us believe that there were more pheasants. He started into a dense bush when we came near to him, bringing out in his mouth a snake, of the kind they call "Spugg-slang," or "Spit-snake." They are considered very poisonous, and the poor dog being wounded in the struggle with that venomous reptile, showed dangerous symptoms soon afterwards. He began to stagger along the path which we travelled, and lost his sight. It was fortunate that we had fresh milk at hand, of which we gave him repeatedly to drink, with which valuable medicine we arrested

the progress of the poison, and the dog was finally, though slowly cured. These kind of snakes are not rare in the western districts of the Cape Colony, towards Namaqualand. They can force, through the hollow of their fang, when they are pursued hotly (as they instantly turn when they cannot escape, facing their combatant), a very caustic acid, smelling like formic acid, and spirt exactly into the face of their enemy. One instance I relate where I pursued such a kind of a snake, near the banks of the Kousie River. Having no chance of escape, it turned round and, facing me, projected a frothy liquid towards me; of which only a small quantity touched the under part of my face, but the most of it fell on my breast. It was fortunate that the distance between me and the snake was about eight paces, otherwise the poison would have infallibly touched my eyes, and blinded me. Thinking that it was an Elak-snake when I pursued it, I had no idea of any danger at such a distance, until I received a warning of that dangerous reptile. We despatched it however; but it cost one of our whip-stakes, which the waggon-driver broke when beating it. These kind of snakes seem to be equally dangerous when they bite with their teeth, as when they spirt through the hollow of their fang a poisonous fluid into the eyes of their pursuant.

We saw in front of us a number of houses, belonging to several families of the emigrants, soon after we left the river, and ascended towards an elevated spot, with the Rhinoster River at a short distance towards our left side, proceeding nearly parallel with it. As our custom was to travel on foot over the fields, joining our waggons at a distance as they went on, and carrying generally a gun with me, I was so fortunate as to shoot a fine adult specimen of *Fultur occipitalis*, Burch., being obliged, however, to creep for a distance on hands and feet in order to come near him. This kind of vulture was first discovered by Dr. W. Burchell, the well-known and distinguished traveller. It seems that the most southern limit of that bird is about here, although they seem rare. We had opportunities afterwards, when we reached the Macalisberg range, to see them more plentifully. They are smaller than the two other kinds, the *V. auricularis* and *V. Rollei*, which are not uncommon within the Cape Colony. As the feathers of this kind of bird are cleaner than those of the two other sorts, it seems that its habit is not so gluttonous as that of its congeners.

We were welcomed at the front of the farmhouses by Mr. Chr.

Hatting, a respectable old man, with whom I have been very well acquainted since the time when he lived in the Tarka (district of Cradock), where he was a farmer, and a man of large landed property. The settlers lived peacefully there until the Kaffir war broke out, when they were very much harassed by their thievish neighbours, and were finally compelled to sell their property and follow the current of emigration. Leaving that good-hearted people, whose houses were erected close to the banks of the Rhinoster River, the route led us chiefly over a country of detached hills, having on our right hand at no great distance a considerable high range of mountains, of a reddish and naked appearance, running parallel with the route. The Vaal River, or Likwa, which we reached towards dark in the evening after travelling fifteen miles, has forced its way through that mountain range, and enters just here at our station into extensive plains, running for a short distance first towards west through moderate hills, turning afterwards south-west, when it flows through extensive grassy plains.

There were many new things, not observed before, amongst the vegetable productions towards the vicinity of the Vaal River, but several were already decayed, or killed by the frosty nights during the winter season. Some species of plants, however, growing in sheltered places, offered still flowering specimens; likewise a fruticose *Hibiscus*, No. 92, with yellow flowers; a creeping *Hermannia*, No. 120; *Acacia hebeclada*, Benth., No. 509, having full-grown seed-pods; *Cephalandra*, No. 580; *Helichrysum*, No. 875; *Aptosimum*? No. 1317; *Barleria obtusa*, N. ab E., No. 1415; *Gnidia*? No. 1490; *Tragia Capensis*, No. 1528; *Androcymbium*? No. 1711; *Ornithogalum*, No. 1684, etc. etc. These plants were growing chiefly on rocky places along the sheltered banks of the Vaal River; but the grassy neighbouring plains showed nothing but a dreary brownish colour as far as the eyes could reach. As a warm and moist atmosphere is so very essential to the luxuriant growth of the genuine *Gramineæ*, and the rainy season over a vast region within the interior of South Africa occurs during the summer months, there is sufficient reason for the dry appearance of a grass-like vegetation during the dry winter.

It was pleasing, and showed a great contrast against the dreary neighbouring plains, to see the banks of the Vaal River bordered by many evergreen shrubs and trees. Its waters, which are running through the whole year, and were of a lucid transparency during the

winter season, become a muddy torrent during the rainy summer months, and are often impassable for weeks. The muddy colour of its water has given rise to the Dutch appellation of "Vaal Rivier," meaning "Tallow River." Captain Harris calls it "Likwa," which is most likely the Matabili name; the more ancient name seems to be "Kygariëp" of the Koras Hottentots, who claim an older acquaintance with that river than the Matabilis.

We remained on the left bank for several days, to give our people time for washing their clothes, etc., while we entered the plains for hunting. We met here for the first time the swift-running boar. (*Phascogaster Africanus*), but were not successful in getting a specimen. We started several lions from their hiding-places; but as we were generally dispersed over the plain, no one durst singly enter into combat with the "king of the plains."

Many remnants of dwellings on both sides of the river, abandoned only a few years since, showed sufficiently the traces of the emigrants, who had advanced more northerly towards the interior.

As the stream was shallow, we crossed the Vaal River without difficulty; the many sunken rocks in the channel however make it dangerous to cross that river during the rainy season, when its waters have lost their clearness. After travelling over a rough and hilly path, and having that range of mountain for a short distance longer on our right hand, like on the opposite side of the Vaal River, we entered again a plain, leaving the mountain range, and arrived towards evening near the dwelling of Mr. Du Plois, one of the emigrants, his hearty welcome inviting us to remain here for the night. The kind wife of the farmer showed us a skin of *Manis Temminckii*, a kind of Armadillo, an animal of the same habit as the Cape Ant-eater (*Orycteropus Capensis*), feeding during night, and which is rather of rare occurrence about these regions. They considered this animal a great curiosity, and expected to sell it to us for a good price; but it was so badly stuffed and preserved that it was valueless, even if it were presented to us. The kind-hearted people gave a curious account of it ere we saw it, describing it to be a kind of a snake with scales, but having four legs. Their ignorance may however be excused, as there are no such animals within the Cape Colony to make them acquainted with them.

(To be continued.)

MR. NATHANIEL WILSON *on the useful Vegetable Products, especially the Fibres, of JAMAICA.*

We have heard rumours, but we trust they are without foundation, of the want of Government support to the Botanic Garden in Jamaica; and that Mr. N. Wilson, its active and very intelligent Superintendent, has left, or is on the point of leaving, the colony altogether. We have ourselves had occasion; in the great Paris Exhibition of the present year, to witness the necessity of some scientific knowledge, in the accurate determination of the plants which yield the various vegetable substances. The Jamaica collection there deposited, valuable as it is in extent, becomes tenfold more important from the *correct* nomenclature of the objects. To say nothing of the noble collections and fine specimens of the Woods, etc., it contains a series of Fibres of the island which is more instructive than any other in the Exhibition, because of the great pains that have been taken by Mr. Wilson to give the scientific and vernacular names, rendering it quite clear what is the exact plant which produces such and such Fibre; while in other collections we find *one* and the *same* name (*Pine-apple, Aloe, Manilla Hemp*, etc.) attached to Fibres from totally different (and to several kinds of) plants. "Si nomina pereunt, perit et cognitio rerum." Such names are worse than useless—they mislead. We believe the latest duties performed by Mr. Wilson in the island were to draw up a Report on the progress and usefulness of the Botanic Garden of Bath, St. Thomas the Apostle, for the past year, 1854, for the information of the Honourable the Board of Directors, and to prepare a full series of the Fibres, etc. for the Paris Exhibition. As these Fibres are described in the said Report, we are tempted to offer the following extracts.—ED.

By a continuous and extensive distribution of plants from this Institution of late years, this Botanic Garden has from a comparative state of obscurity been brought into one of practical utility and national importance, evidenced by the dissemination of thousands of plants, both useful and interesting, where such were never seen or heard of before. Consequently the limits of this Garden have rendered it totally inadequate to meet the exigency of the present demand, or to do anything like justice to the constantly-accumulating collection of plants, being only one and three-quarter acres in extent. The new plants have therefore to be disposed without plan or arrangement, wherever a few feet of spare ground

can be found, and consequently they suffer much for want of space. You are aware of this circumstance, as I have mentioned it in my last Report. My object in again bringing the subject to your notice is that you may, in conjunction with your general Report on the state of the Institution, lay before the Executive the circumscribed state and difficulties under which the Botanic Garden is now suffering; in order that no time may be lost in remodelling, if possible, and placing the interests of the Garden on an extensive, permanent, and useful basis, adequate to meet the increasing wants of the community, and to do justice to a popular, useful, and highly increasing science.

The Cappan and Cam dye-woods, Nutmeg and Cinnamon plants, have been distributed to all parts of the island, and I have still a few on hand. As to their perfect suitability to this climate and soil, none need entertain the slightest doubt. The distribution of plants in general have amounted to 1720, all of which were fully established in baskets, so that no loss could possibly take place but by wilful neglect.

The desire for growing new plants and adopting new staples is daily on the increase, and the necessity of a more varied cultivation among our agriculturists has become indispensable in keeping pace with the times and making the most of altered circumstances. I have many useful plants to recommend for this purpose before closing this Report, whereby large tracts of waste land may be reopened advantageously at little outlay.

The importation of plants last year has been unusually large, and of a varied description, comprising the following genera, viz. :—

<i>Behmeria nivea.</i>	<i>Medinilla speciosa.</i>	<i>Dipladenia splendens.</i>
<i>Antiaris saccidora.</i>	<i>Nematanthus longipes.</i>	<i>Dipladenia urophylla.</i>
<i>Datura sanguinea.</i>	<i>Habrothamnus Schottii.</i>	<i>Hexacentris Mysorensis.</i>
<i>Jatropha panduræfolia.</i>	<i>Dipteracanthus affinis.</i>	<i>Rhynchospermum jasmini-</i>
<i>Clerodendron macrophyl-</i>	<i>Abutilon Van-Houttii.</i>	<i>florum.</i>
<i>lum.</i>	<i>Gardenia Thunbergii.</i>	<i>Dractena ferrea, var.</i>
<i>Hoya grandiflora.</i>	<i>Rhodostoma gardenioides.</i>	<i>Pterocarpus sp. from Pulo</i>
<i>Ardisia acuminata.</i>	<i>Goethea strictiflora.</i>	<i>Penang.</i>
<i>Poinciana Gilliesii.</i>	<i>Coleus Blumei.</i>	<i>Rondeletia speciosa, major.</i>
<i>Plumbago Capensis.</i>	<i>Maranta sanguinea.</i>	<i>Pandanus variegatus.</i>
<i>Vanhouttia calcarata.</i>	<i>Ixora coccinea, superba.</i>	<i>etc. etc.</i>

The first-mentioned in the list is the celebrated *Grass-cloth* plant, extensively cultivated in China, and whose fibres make the finest cloth

the Chinese can boast of. I have not the slightest doubt as to its perfect adaptability to this climate and soil, and in the course of a few years it may become a weed. The *Antiaris* is the notorious Upas-tree of Java, about whose virulent properties so many fabulous statements have appeared from time to time. The *Pandanus variegatus* is another addition to our textile plants, and one of the most noble and beautiful plants that ever adorned a garden; the others on the list are chiefly new and interesting, collected in many parts of the world, and selected for this climate.

By the acquisition of these plants, we can now boast of possessing the finest fibres and the greatest number of textile plants in the world, hitherto of no avail to the country in general, and held of little value by individuals, but which may now be turned to the greatest account in a national point of view; the universal demand and scarcity of Fibre, its high and daily increasing price, rendering the materials from which it is manufactured of the highest importance. We have many indigenous and eminently textile plants diffused over the island, but partially or not at all known to be applicable for textile purposes, except to a few gentlemen acquainted with the botany of the country. I have therefore prepared for general information fifty-one samples of Fibres, the greater part of which are indigenous; as you will observe by the following list comprising them:—

<i>Yucca gloriosa</i> . Adam's Needle, 5-6 feet.	<i>Agave Americana</i> . American Aloe.
<i>Yucca aloifolia</i> . Common Dagger.	<i>Canna Indica</i> . Indian shot.
<i>Bromelia Karatas</i> . Silk-grass leaves, 10-12 feet.	<i>Triumfetta semitriloba</i> . Common Bur-bark—a weed.
<i>Bromelia Pinguin</i> . Pinguin.	<i>Malvaviscus arboreus</i> . Bastard or Wild Mahoe.
<i>Ananas sativa</i> . Pine-apple.	
<i>Musa sapientum</i> . Banana.	<i>Abroma augusta</i> . Abroma.
„ var. <i>Martinique</i> Banana.	<i>Kydia calycina</i> . Tree, 25 feet.
„ <i>paradisiaca</i> . Plantain.	<i>Helicteres Jamaicensis</i> . Screw-tree.
„ <i>Cavendishii</i> . Chinese Plantain.	<i>Guazuma ulmifolia</i> . Bastard Cedar.
„ <i>violacea</i> . Violet-flowered Plantain.	<i>Kleinhoffia hospita</i> . Tree, 25-30 feet.
„ <i>coccinea</i> . Scarlet-flowered Plantain.	<i>Sida</i> sp. Shrub, 6-8 feet.
<i>Heliconia Bikai</i> . Wild Plantain.	<i>Ochroma lagopus</i> . Down-tree.
„ <i>Brasiliensis</i> . Ditto of Brazil.	<i>Cecropia peltata</i> . Trumpet-tree.
„ <i>psittacorum</i> . Parrot-beaked do.	<i>Cordia Sebestena</i> . Scarlet Cordia.
<i>Tillandsia serrata</i> . Wild Pine (epiphyte).	„ <i>Gerascanthus</i> . Spanish Elm.
„ <i>usneoides</i> . Wild Pine.	„ <i>macrophylla</i> . Man-jack, or broad-leaved Cherry.
<i>Pandanus spiralis</i> . Screw-pine.	

<i>Cordia Collococca</i> . Clammy Chérny.	<i>Hibiscus elatus</i> . Mahoe.
<i>Brosimum spurius</i> . Milk-wood.	„ <i>latifolius</i> . Broad-leaved Mahoe.
<i>Ficus elastica</i> . India-rubber-tree.	„ <i>tiliacens</i> . Sea-side ditto.
„ <i>religiosa</i> . Popul-tree.	<i>Lagetta lintearia</i> . Lace-bark.
„ <i>virens</i> . Wild Fig-tree.	<i>Daphne tinifolia</i> . Burn-nose bark.
„ <i>Americana</i> . Wild Fig-tree.	<i>Cocos nucifera</i> . Cocoa-nut.
<i>Hibiscus Rosa-Sinensis</i> . Shoebblack-tree.	<i>Artocarpus incisa</i> . Bread-fruit.
„ <i>lilijlorus</i> . Lily-flowered ditto.	<i>Pterocarpus santalinus</i> . Pterocarpus.
„ <i>esculentus</i> . Ochra.	<i>Crotalaria juncea</i> . Rattlewort.

The above list will be found to comprise fibre of such quality and colour, from the Cocoa-nut Coir to filaments resembling fine silk in strength and lustre of appearance, as cannot be surpassed. I might have extended the list to greater length, but I believe the enumeration will convince the most sceptical that this island abounds with a highly valuable description of textile plants, some of which are considered troublesome weeds. Those of a ligneous nature will annually produce two crops of shoots, from which good fibre may be obtained, requiring no machinery whatever in preparing it for market. The method I have pursued, as being the most easy and simple, is this:—Macerate the shoots until the cuticle or outer bark separates freely from the true bark: the latter will then be removed readily from the ligneous part, and requires but little labour or knowledge to wash, dry, and pack the fibre for market: this would furnish healthy employment for children, the aged and infirm, and would not diminish the amount of labour on plantations.

For the Plantain, Pinguin, and all similar herbaceous plants, machinery is absolutely necessary to separate and clean the fibre advantageously; when this desideratum is accomplished, and with one or two years' practice, there is nothing to prevent Jamaica competing with any part of the world of ten times the same extent. The inducement to do so cannot be much greater than it is at present. I find, by a statistical account, that the imports of flax into the United Kingdom during 1853 amounted to 94,163 tons 14 cwt., and, at the exorbitant price of £110 per ton, to which the average price of foreign flax has already risen, shows a sum of £10,358,007, which has been paid in cash for foreign flax-fibre last year; and since the prohibition of Russian hemp into European markets, prices and demand are increasing daily.

My motive for laying before you my views on this subject, and pre-

paring the samples of fibre for your inspection, is, that I am anxious to submit to you, and through you to the agriculturists and people in general of this island, the desirability and advantages in an individual and national point of view to be derived from the adoption and extensive cultivation of fibrous plants. As I have already mentioned, the great scarcity, exorbitant price, and widely-spreading demand for fibre throughout the world, render the materials of which it is manufactured of much importance, particularly in this country, where labour is scarce and dear, and agriculture at its lowest ebb. Many of these fibres will be found of superior quality, and produced in greater abundance than any grown in temperate regions.

I have made a very moderate calculation of the produce of an established field with Plantains, which I find to be as follows :—

An acre planted with suckers, at 10 feet apart, will contain	
435 plants, and the first year will produce as many bunches	
of fruit worth 6 <i>d</i>	£10 17 6
Each stem will yield 1 lb of finely-dressed fibre, worth 6 <i>d</i>	10 17 6
Amounting in all to	£21 15 0

There can also be raised on the same land, along with the plantains during the first year, a crop of yams, corn, kidney-beans, and sweet potatoes, worth at least £20, thus realizing the first year £41. 15*s*. The second year each plantain-stool will throw up three or more suckers, the quantity of fibre will thereby be tripled, and succeeding years would add to the produce; and if the plantain is cut before the fruit is formed, the quantity of fibre will be fully one-third more, of a far superior quality. I may here remark that the Banana is a much hardier plant than the Plantain; it will live and thrive at an elevation where the latter would not exist. In selecting any particular variety of the *Musa* for cultivation, great care ought to be observed, as on this point much of the success depends.

In connection with this branch of industry, other plants, although of less importance, ought not to be lost sight of, being available in meeting a great deficiency as materials for the manufacture of paper, such as many of our very soft and spongy woods, which cannot be classed among timbers; the various and inexhaustible supply of tough withes, reeds, grasses; and, perhaps superior to all, the refuse of arrowroot, as it comes from the mill, divested of its starch; many tons

of this are annually wasted, being thrown on the dunghill. The above-mentioned materials are far more likely to answer the purpose than the Bamboo, so much used in China for making paper.

I shall conclude by briefly describing another plant (the *Pothos violacea*), admirably adapted for all descriptions of fine straw-plats, particularly where strength and richness of appearance are desired; its plat will be found superior to the best Leghorn plat. This plant, although an epiphyte, and growing plentifully at the roots and on the tops of the highest trees, at an elevation on the mountains not under 1000 feet, may readily be cultivated in woodlands and moist places. The part made use of is the petiole, or footstalk of the leaf, which grows from eighteen inches to two feet long, and readily divides into strips of any dimensions, and contains a strong fibre, which the common plat made from the fan-palms does not, and seldom retains colour long. These advantages may tend to bring the plant into notice after awhile; and if, through my humble endeavours, any of the undeveloped resources of the country are brought into notice, a happy result will be effected.

ASPLENIUM FONTANUM, Br., a British Plant; by SIR W. J. HOOKER, K.H., F.R., A., and L.S.

In consequence of my having recently received, from near Cork, a specimen of a Fern, supposed to be *Asplenium fontanum*, Br.,—*Polypodium*, L.—(but which proved to be a state of *Cistopteris fragilis*), I have been led to direct my attention to the consideration of this beautiful species as a native of Great Britain.

Hudson is the first authority for its being so deemed (*Flora Anglica*, p. 456):—"Habitat in muris antiquis et rupibus, supra Hamersham (or Agmondesham, Bucks,) Church, *D. Bradney*; in locis saxosis, prope Wybourn in Westmorlandia." To the first of these two localities Sir James Smith, in '*English Flora*,' adds the remark, "Whence it was brought alive to Kew Gardens by the late Mr. Aiton,* from whom I have a specimen; but the church has been whitewashed, and the plant destroyed."—In relation to the second locality Sir James Smith says, *l. c.*, "Mr. Hudson gathered the same in a stony situation near

* It consequently appears in the '*Hortus Kewensis*,' vol. iii. p. 463, as a native of England.

Wybourn, in Westmoreland; or rather, perhaps Wiborn in Cumberland." Mr. Hewett Watson (Cybele, iii. 275) justly observes that Mr. Hudson has given this second station more vaguely than the first, and without personal authority expressly cited." The same vagueness in regard to this locality unfortunately exists in the Herbarium of Mr. Lightfoot, formerly in possession of Queen Charlotte, now in that of Mr. Brown, who has just shown me, in that herbarium, true and undoubted specimens of this British rarity,—so rare that some writers have wholly ignored its existence as a British plant; while Mr. Watson has been led to remark, "It is to be feared that we have at present only garden plants, or errors of name, as the data for considering *A. fontanum* a British species."

Lightfoot's specimens are attached to one leaf of a folded sheet of paper. On the opposite leaf is written, by Lightfoot himself,—

"*Polypodium fontanum*" (here follow the synonyms and characters copied from Linnæus and Ray, adding the remark):

"Upon the rocks about Wybourn, Westmoreland;" and then,

"This I gathered on Ammersham Church, Bucks."

One does not see well how the accuracy of this statement can be called in question.

In the 'Phytologist' for 1852, p. 477, a new locality, by "C. Wood," is given: viz. "On the south-west side of Tooting Common, in the crevices of an old wall of an isolated mansion, called Furze Down, the property of — Haigh, Esq., whence I obtained plants, and supplied my friends therewith." At the same time with this statement, Mr. C. Wood sends to Mr. Newman a specimen taken from a frond gathered in the above locality. This frond, in the next sentence, Mr. Newman pronounces to be "the divided form described" (where?) "as a distinct species, under the name of *Asplenium Halleri*."

The paragraph that stands next to this in the 'Phytologist' is a query inserted by a correspondent, whose signature is "J. V. V.:" "Why is this species omitted in recent works on Ferns?"—The answer is by Mr. Newman: "Because I can find in no herbarium a frond, or even a fragment of a frond, gathered within the kingdom of Great Britain and Ireland. The Fern found at Kirk Hammersham, or Hammersham Church, as Hudson has it, appears to have been *Cistopteris fragilis*."*

* A view too hastily adopted, as it now appears, by others, as well as by ourselves, in Brit. Fl., ed. 7.

He cannot have overlooked the circumstance of his having received a frond of the *Halleri* form of the species, and thus we must presume he had no confidence in the locality.

In the 'Phytologist' also for 1852, p. 519, the Rev. Mr. Bloxam has recorded two new localities: one on the authority of specimens in Dr. Power's (of Atherstone) Herbarium, gathered by Dr. Power in Wales, "between Tan-y-Bwlch and Tremaddock," identified by Mr. Bloxam; and "at the Swanage Cave, near Tillavilly, Isle of Purbeck, Dorsetshire," by Miss Power; but of which all the specimens had been given away.

The latest published station is that announced by a letter (accompanied by specimens) from the Rev. W. H. Hawker, received at a meeting of the Linnæan Society, December 23, 1852. That gentleman had known it for several years growing abundantly and luxuriantly with other Wall-Ferns on the north side of an old wall, *not far from Petersham*, very judiciously declining to publish the exact locality. Notwithstanding that the particulars of this discovery are fully related in the 'Phytologist,' 1853, the species is still omitted by Mr. Newman in his edition of 'British Ferns,' published in 1854.

Lastly, we may mention that Mr. Brown has in his possession true specimens of this plant, labelled "as growing wild on rocks within two miles of Alnwick Castle, Northumberland," and sent by his Grace the late (third) Duke of Northumberland, with other plants for cultivation at Syon. The remarks accompanying them are not in the handwriting of the late Duke, but apparently of some person in a much less educated sphere of life, probably one of the gardeners; and as if corroborative of their being from the native station, it is added, "pieces of rock were adhering to the roots." No responsible authority however is given.

In the absence of such authority as that now alluded to, and also where neither the locality nor the specimens have been certified by a competent botanist, we must, in endeavouring to determine what stations are worthy of credit, consider the geographical position of the species on the Continent. We shall find, I think, that it is neither northern nor alpine. "*Ad rupes, muros, in locis saxosis, non ad fontes;*" — "*Germaniæ australis, Helvetiæ, Galliæ, Willd.*" Specimens in our own Herbarium are from such localities. It finds no place in the Floras of Denmark, Norway, and Lapland. Most of the Russian stations are

given with a mark of doubt by Ledebour (Flora Rossica, vol. iv. p. 519). We may observe also that our two northern reputed localities especially require confirmation, viz. Hudson's Westmoreland station, and that in Northumberland. Berkshire we consider authenticated by Lightfoot. Mr. C. Wood, allowing that his plant is our *A. fontanum*, or a variety of it (*A. Halleri*), does not appear to have gathered it himself. He "obtained his plants and supplied his friends therewith through Mr. Gibbs," and when he did visit the walls in question found them fresh pointed, and no trace of the plant. The Welsh station (in South, not North, Wales) is testified by Mr. Bloxam to be correct; and that of Swanage Cave is quite likely to be so; while the Hampshire specimens are stamped with the authority of the Linnæan Society as well as that of the reverend discoverer, Mr. Hawker.

BOTANICAL INFORMATION.

*Extracts from the Jurors' Reports on some of the VEGETABLE PRODUCTS
of the Madras Exhibition of 1855.*

(Continued from p. 316.)

6. *Ophelia elegans*. Two bundles of a vegetable drug in considerable demand to the northward, where it is used as a bitter and febrifuge, are exhibited by the Honourable W. Elliot, Esq. The plant, when carefully examined, proves to be *Ophelia elegans* (vide Wight, Icones, 1331), closely allied to, and greatly resembling, *Chiretta*: the native name is "Salaras" or "Salajit;" the stalks are sold bound together in bundles about one foot long, and a little thicker than a man's arm. The drug is exceedingly cheap, and the amount exported is considerable; to what extent it is employed is difficult to ascertain, as it is confounded in the bazaar with *Chiretta*. For the interesting fact of a new Gentian being thus brought into notice, and for the specimens sent, the Jury are indebted to the Honourable W. Elliot, Esq., and award to him a Second-class Medal.

7. *Ganta Caringa*, the root of a plant, growing in the hills about Lamsingi, to the west of Vizagapatam. It is mentioned by Ainslie, p. 112, under its Tamil name, "Chirudekku." (Honourable Mr. Elliot.)

The same drug is contained in the Canara and Travancore collections; the plant yielding these roots is unknown.

8. *Senna*. A fine specimen of *Tinnevelly Senna*, cultivated near Cape Comorin, may be noticed as of a superior quality. It is satisfactory to notice that *Senna* grown in the Southern provinces of the Presidency is highly esteemed in Britain, and preferred by many to all other sorts, as being both cheaper and purer.

9. *Catechu* (*Kuth*, or *Terra Japonica*). Of this astringent there are many samples, which may be reduced to three varieties; these are as follows:—1. Circular flat cakes, from Travancore, covered on both sides with paddy-husks. 2. Large flat cakes, from the Northern Division, varying in colour from brick-dust to dull yellow. 3. Round balls of a dark brown colour, the size of a small orange, from Mangalore, where a large manufacture takes place. These two sorts appear identical, or nearly so, varying only in shape. There is likewise a piece of the wood of *Acacia Catechu*.

10. *Gambir*, from Rangoon, in cubical cakes, covered with a Malvaceous leaf.

11. *Kino*, the natural exudation of *Pterocarpus Marsupium*, is an article of export from the Malabar coast. Several specimens exhibited are quite identical with the *Kino* of commerce.

12. *Extract of Hyoscyamus*. A large fresh specimen has been forwarded from Hoonsoor, prepared by Assistant-Surgeon Hilberse; this quality of the extract has been thoroughly tested in the different civil dispensaries, and it has been pronounced equally useful with the European article. Considering that this valuable medicine has been prepared for the first time in the Presidency, the Jury award a Second-class Medal.

13. *Gamboge* has been forwarded from Goa, Mysore, Canara, Malacca, and Labuan. The specimen from Malacca, exhibited by Lieutenant Evans, 51st N. I., is the finest pipe variety; all the others are in the form of lumps or tears. The series is very instructive, showing how much the commercial character of this product may be altered by trivial circumstances, the exudation being yellow, reddish, or brown, and of different degrees of solidity, according to the season of the year, and the method of manipulation. It has been shown that the peninsular Gamboge is a useful pigment, and an effective purgative. It has been lately added to the list of country medicines; and it appears that the

tree is so abundant along the coast of the Ghauts, that the product may be obtained in very considerable quantities in the forests of Mysore, Malabar, and Canara. The Jury award a Second-class Medal to Lieutenant Evans; also a Second-class Medal to the Government of Goa; and another to Apothecary Wrightman, who has collected this product with much care, in homogeneous masses, without air-vessels, and free from woody fibres or other impurities.

Captain Blagrave contributes a specimen of *Barilla*, or crude Sub-carbonate of Soda, prepared from the ashes of *Salicornia Indica*. Captain Blagrave not having furnished any data as to the mode of preparation, or cost involved, the Jury are precluded from gaining even an approximative value of the article. The Jury remark that this is a source from which large quantities of alkali might be procured, as these saline plants grow abundantly in the saltmarshes and back waters of this Presidency. It is doubtful however, whether, even taking into consideration the cheapness of labour, the manufacture could come into competition with the more economical processes for procuring this substance from dhobeas earth (native carbonate of soda), or from sea-salt.

APPENDIX A.—Statement showing the articles exported from the Madras territories by sea, for the year 1854 :—

	Cwts.	Rupees.
Catechu	1,369	6,984
Kino	66	1,031
Gamboge	None	
Country Sarsaparilla	269	1,699
Senna	404	2,917
Lemon-Grass Oil	None	

COSTUS AFER, Ker; *a reputed Specific against Nausea.*

Captain J. H. Selwyn, R.N., of H.M.S. Prometheus, in March last, brought home with him from the west coast of Tropical Africa, a living plant of what is there considered a specific against nausea, which, through the kindness of the Honourable W. Fox Strangways, has been presented to the Royal Gardens, accompanied by the following description :—

“This plant comes from the Isles de Los, about sixty miles north of

Sierra Leone, west coast of Africa. It is valued by the natives as a specific against nausea, from whatever cause arising; and the part used is the stem, after stripping off the leaves, and peeling. The leaves however will probably be found to contain a considerable quantity of the active principle, as well as the stem, though the latter alone is employed. It is eaten in the green state, and is perfectly harmless. The taste resembles that of the common *Oxalis Acetosella*. A peculiarity of its growth is, that it has no seed, nor does it propagate from suckers; but the flower-head, after shooting out its flowers, and by its weight bending the long stem to the ground, gradually withers, while a new plant arises from its base, and obtains nourishment from it, while forcing its roots into the soil, which is the light volcanic loam which is sent with it. The climate is dry heat from November to March, and rains more or less frequent during the other months, with almost constant heat. It is a very free grower in Africa, and therefore easily obtainable in any quantity, if found to be so valuable as it would seem for medicinal purposes. As far as I have had the opportunity of trying it, it has been uniformly successful in relieving nausea. The leaves are dark glossy-green, the flower-head also; and the flowers are white, and yellow towards the mouth,—altogether a handsome plant.—J. H. SELWYN."

It was easy to see, from the habit and foliage of the plant, that the plant belonged to the Scitamineous family, and the opinion was confirmed by a pencil-sketch of the flowering plant sent by Captain Selwyn. It produced its flowers in the stove in the month of September, and proves to be a *Costus*, and the *Costus Afer* of Ker in 'Botanical Register,' tab. 683; though that figure is evidently made from a very imperfect specimen, which gives no idea of the beauty of the blossom, which is large and white, and, as Captain Selwyn says, really handsome.

We have had no means of proving its remedial qualities; should it indeed possess them, they are probably rather attributable to the aromatic and stomachic properties which prevail in the Order, than to the acid. The roots of *Costi* are bitter, and have had a great reputation as tonics, but are now out of use; and Dr. Lindley says the *Costi* of Brazil have a subacid, mucilaginous juice, which is used in some disorders, and held in very great repute by the natives; but we are not aware that the property attributed to the present species is at all known

to the Faculty. We should be happy if any one who has the inclination and the opportunity would test the fact.

De Candolle's Prodromus.

We are happy to inform our readers that the fourteenth volume of this most important work will be in the press this present month, and will commence with Dr. Meisner's *Polygonaceæ*, the manuscript of which indeed has been prepared these eighteen months. This learned and indefatigable botanist has also finished the elaboration of the *Proteaceæ* and *Thymeleæ*; so that the printing of those families can, and we hope will, go on without interruption.

Note on CLUSIACEÆ; by Mr. Spruce.

In a late number of the 'Morning Chronicle' I saw an account of a paper read by Mr. Miers, at a meeting of the Linnean Society, on the structure of the seeds of the *Clusiaceæ*. I did not know previously that any doubt existed on this subject. Undoubtedly the cylindrical mass is the radicle, or, more properly speaking, the caulicle, and the two minute parallel plates at the upper extremity are the cotyledons. I enclose germinating seeds of a *Clusia*, which I picked out of a decayed fruit a few days ago, under a tree of what seemed *Clusia speciosa*, Mart.; but I was unable to get down a branch, to enable me to decide with certainty. The mode of germination of the terrestrial *Clusiæ*, in their native forests, is the following:—The fruits (five- to twelve-valved) burst open in a stellated manner, usually before falling off the tree, the fleshy valves spreading at a greater or less angle, but not rolled or bent back on the peduncle, as in the *Tovomilæ*. When they are detached, their shuttlecock-form causes them always to alight on the ground with their base downwards. They are now visited by ants, which speedily eat away the red aril of the seeds,* and the latter begin to germinate, while still attached to the fruit. The caulicle bursts

* Owing to the bitter milky juice of the *Clusia*, they are rarely visited by ants, and the aril is the only part which these insects find palatable. Possibly the seeds of the epiphytal *Clusiaceæ* are swallowed by birds, and thus deposited on the branches of trees in the same way as those of *Loranthaceæ*.

through the upper extremity of the testa, bearing at its apex the scarcely perceptible cotyledons; and immediately afterwards its opposite end sends down a radicle, piercing first the testa, and finally the decaying pericarp. By this time the caulicle has attained a length of an inch or an inch and a half, and the cotyledons a diameter of one to two lines; and the pericarp is so far decayed that the young plants are released and dispersed by the winds and rains, taking root wherever they fall on suitable ground.

NOTICES OF BOOKS.

WILLKOMM, MORITZ: *Icones et Descriptiones Plantarum novarum criticarum et rariorum Europæ Austro-Occidentalis, præcipue Hispaniæ*. Imp. 4to. Lipsiæ. Fasc. 6-9.

The views of botanists must be expected to differ, as to the importance or requirement of very full and elaborate plates for the purpose of critically illustrating the differences between *species* of plants which many consider of doubtful value as such. We think that such are not imperatively needed, and therefore we repeat our regret, expressed in our notice of the earlier fascicles of this work (see our Vol. VI. p. 352); and we lament that such well-executed plates and such good and large paper and type are not devoted to plants of more universal interest to scientific botanists. It is not till we come to the eighth fasciculus that the figures and descriptions and remarks on the species of *Silene* are concluded. This division of the work is finished by a synopsis of the species (in Europa Austro-occidentali provenientes), seventy-three in number, arranged according to the subgenera and sections; and we cannot but think that Botany would have been a gainer, if critical remarks had been given under these respective species and figures of the needful distinctions,—especially of those parts which are so ably pointed out as exhibiting the “characteres maxime constantes” of this genus, at p. 71. We will take for example the two plants so well represented and coloured at tab. 51:—A. *Silene bryoidea*, Jord., and *Silene acaulis*, L. Both are such faithful portraits of the well-known *Silene acaulis*, that it requires a very keen and a quick eye to discover, at first sight, any difference between the two. But of *S. bryoidea* it is said, “Species

elegantissima affinis *S. acauli*, L., et *S. exscapæ*, All., et quasi intermedia inter hasce stirpes, quas auctores permulti conjunxerunt (and no wonder) *quamvis certissime characteribus bonis et constantibus distinctæ sint.*" . . . "Jam vero quæritur, num *S. bryoidea* propria sit species an non. A *Silene* enim *acaulis* non differt nisi calyce non umbilicato (limbo petalorum integro, capsula latiore et breviori omnibusque partibus, exceptis foliis, majoribus"—almost imperceptible distinctions); "*Silene* autem *exscapa* non nisi floribus subsessilibus duplo minoribus et capsula ovali calyce subinclusa ab ea distincta est. Jam quum *S. bryoidea* in consortio *Silenes acaulis* et *exscapæ* crescat, hanc stirpem nil nisi formam inter illas duas species hybridam esse, valde probabile mihi videtur."—Surely a subject hardly meriting an imperial-quarto plate and a page and a half of descriptive matter!

The *Alsineæ* follow in the work next after *Sileneæ*. *Malachium calycinum*, Wilk., very nearly approaches *M. (Stellaria) aquaticum*, Fr. Five species of *Cerastium* are figured, and a Conspectus of species is given, twenty in number. Tab. 60 B. represents a new *Mænchia*, *M. octandra* (*Malachium octandrum*, Gren., *Cerastium cœruleum*, Boiss.). Two species of *Mœhringia* are figured, and six recorded. The *Stellariæ* of Austro-occidental Europe are, all of them, British. The ninth fasciculus closes with the tenth species of the genus *Arenaria*, viz. *A. serpyllifolia*, L. All are well executed plates, with ample diagnoses.

FLORA UNIVERSALIS in colorirten Abbildungen. Ein Kupferwerk zu den Schriften Linné's, Willdenow's, De Candolle's, Sprengel's, Römer's, Schultes's u. A. Herausgegeben von Dr. DAVID DIETRICH. Small folio. Jena. Fasc. 8. Ten Plates.

Of this new work, now in the course of publication, as it would appear, at Jena, we have seen only one fasciculus (the eighth, issued in August, 1855), which has been addressed to us by Dr. Sonder. It is unfortunately unaccompanied by any notice or prospectus, beyond what is learned from the title. Judging by that and the contents of the present number, the object of the work is to give coloured representations of new plants, or of such as have not been figured previously, with dissections. This fasciculus is accompanied by a page of letter-press, confined to the name of each, a reference to the author who has described it, and an explanation of the dissections of the flowers, etc.

The representations are satisfactorily executed, not in the first style of botanical drawing, and apparently from Herbarium specimens; and if the latter be the case, it is quite certain we cannot trust much to the accuracy of colouring; still we know well how much colour recommends a botanical work to subscribers, and we had rather see such plates indifferently coloured than not published at all. The present number, at least, seems to have been conducted under the eye of Dr. Sonder; and if all the work be so, that is a pledge of its respectability and usefulness, and we cannot but wish it success. If it can be afforded at a moderate price (but on that score the wrapper gives no information), we believe it would command an extensive sale, for such a work is much wanting to all students of universal botany. The plants here given on the ten plates are—Tab. 71, *Petrophila media*, Br., and *P. longifolia*, Br.; 72, *Eriosema Guerinii*, Sond.; 73, *Lambertia uniflora*, Br., and *Petrophila biloba*, Br.; 74, *Anigosanthus bicolor*, Endl., and *Conostylis candicans*, Endl.; 75, *Cineraria deltoidea*, Sond., and *Senecio megaglossus*, F. Müll.; 76, *Phyllopappus lanceolatus*, Walp.; 77, *Wedelia Natalensis*, Sond.; 78, *Ozothamnus thyrsoideus* and *O. obcordatus*, De Cand.; 79, *Polygala decora*, Sond.; 80, *Johnsonia mucronata*, Endl., and *Laxmannia ramosa*, Lindl.

MOORE, THOMAS, F.L.S.: *The FERNS of Great Britain and Ireland.*
Edited by JOHN LINDLEY, Ph.D., F.R.S., etc. Imp. folio. Part VII.
 Nature-printed by Henry Bradbury. London. 1855.

We have not much to remark on the present fasciculus of this work, which includes only one description, viz. that of *Lastrea spinulosa* (*Aspidium*, Sw.). In our last notice, p. 320 of this volume, we observed that we should be glad to see how the author would treat this species, which he has included under *L. cristata*, Tab. XIX., as if a form of that species; and yet reference is made to *L. spinulosa*, Plate XXI. (the first of the present Number), as a distinct species. If this latter be a correct view of the point in question, he should not have brought it under *L. cristata* at all. But here it does stand a distinct plant. That Mr. Moore should find it difficult to determine the synonymy, "in consequence of the confusion which has generally existed between it and *L. dilatata*, which renders almost all the published statements open to doubt as to the species to which they really belong," we can well un-

derstand; yet not one is marked with an expression of doubt. We think he might with equal safety have included *spinulosa*, var. *α*, 'Brit. Flora,' ed. 7, our simplest form of *Aspidium spinulosum*. But most of his remarks on the "geographical distribution," particularly when he has seen specimens in Herbaria, prove that the author only recognizes the species in the exact form in which he figures it; or else why remark, "*It would appear to occur at St. Petersburg (Hb. Oxon.), and Moscow (Hb. Hooker); in Switzerland (Hb. Oxon.);*" and again, "*We believe we may also here refer specimens from Labrador, Boston, and Canada (Hb. Hooker); though, according to Dr. Asa Gray, the common American plant of this affinity is not L. spinulosa, but L. intermedia*"? Then come remarks on the specific distinctions between it and *L. dilatata* and *cristata*; and the result of the strict investigation is given in these words:—"Indeed, so closely do these merge into each other by means of transition-forms of frond, that we are forced to the conclusion that they are all three in reality mere variations from one specific type." We marvel that an author arrived at this conclusion should think of thus separating them.

The description of Plate XXII., *Lastrea dilatata*, we are told, will be given in the next Number, together with figures of its varieties.

Plate XIII., given in this Number, *Polystichum angulare*, vars. *subtripinnatum*, and *tripinnatum* and *proliferum*, has been described under Plate XII.

STEUDEL, E. G.: *Synopsis PLANTARUM GLUMACEARUM*. Stuttgard.
One Vol. in Two Parts. Large 8vo. 1855.

Our readers will be glad to know that this contribution towards a universal flora is completed. The work embraces, first, all the true Grasses, occupying 474 closely-printed pages, in double columns, each species distinguished by a long specific character, accompanied by a single reference to the original author, and to a figure (if such exists), and to the country of which it is a native. The second part extends to 348 pages, on the same plan, and includes, besides the true *Cyperaceæ*, the allied families of *Restiaceæ*, *Eriocauloneæ*, *Xyrideæ*, *Desvauxiæ*, and *Juncææ*.

The work has the merit of bringing together in one volume all the genera and species of these families, scattered through a multitude of

works; to which several new species are added by Dr. Steudel himself. On this account we hailed its appearance: but it cannot be expected that the author has been in a condition, by severe study and the inspection of numerous collections, to undertake a critical investigation of the merits of the respective species of authors. We have noticed (in our Vol. VI. p. 256) the vast augmentation of species, or supposed species, of *Paspalum* and *Panicum*. Other genera of *Gramineæ* show a like increase.

In the Second Part, *Cyperus* counts 673 species (!); *Isolepis*, 200; *Fimbristylis*, 191; *Scleria*, 149; *Carex*, 800 (and these do not include the new species known but to, but as yet unpublished by, Dr. Boott); *Eriocaulon*, 209 species. Each part concludes with a full index of genera and species.

KLOTZSCH, J. F.: *BEGONIACEEN-Gattungen und Arten*. 4to, with Twelve Lithographic Plates. Berlin. 1855.

We noticed the Conspectus or Prodrömus of this beautiful work at p. 160 of the sixth volume of this Journal. The present is a quarto volume, of 135 pages (of which the first nine are devoted to introductory matter), accompanied by twelve plates, beautifully executed, illustrative of the forty-one genera into which the old *Begonia* is divided—we wish we could say appropriately; but surely so very natural a genus will not bear such a multiplication of really tangible or natural genera: and we cannot see how the cause of science is advanced by making the slightest difference in some part of the flower or fruit a ground for constituting a new genus: we should question the propriety of many forming even sectional characters. Such well-executed figures and carefully-drawn characters of the species cannot fail to be highly useful in the study of this extensive and difficult genus or group, especially of the South American species, in which the Berlin Gardens and Herbaria are so eminently rich. The rarer Indian species must be sought for in the English and Dutch Herbaria. It is to be regretted that there is now a passion for hybridizing the *Begoniæ* in cultivation, thus tending to destroy all tangible characters, whether generic or specific.



Notes on the ROOGEE of Kumaon, MEGACARPÆA POLYANDRA; by
 GEORGE BENTHAM, ESQ., F.L.S.

When Captain R. Strachey and my much-lamented friend the late Mr. J. E. Winterbottom first returned from their Himalayan travels, they mentioned to me as one of the greatest curiosities amongst the numerous botanical treasures they had brought home, a Polyandrous Cruciferous plant. Hoping that so very abnormal a condition of the parts of the flower might tend to elucidate the much-disputed morphology of the Order, I obtained from them the loan of their specimens of this *Roogee* from Kumaon, as well as of a somewhat similar plant which Mr. Winterbottom had gathered in the valley of the Kishnagunga, where also he had met with the true *Roogee* at a greater elevation. A very slight examination prevented any hesitation in referring these plants, not only to the Order of *Crucifera*, but to the well-marked South Siberian genus *Megacarpæa*; notwithstanding the multiplication of stamens, which would, in any artificial system, have removed them far away. But all my endeavours to trace any symmetry in the arrangement of the additional stamens, or to detect any indication of their morphological origin, proving at that time fruitless, I returned the specimens, suggesting for those of the *Roogee*, which were alone in a perfect state, the specific name of *Megacarpæa polyandra*, to which my friends agreed, and which, although not then published, has since been adopted.

In the meantime, seeds of the same plant were (in 1849) transmitted by Colonel Madden from Kumaon, to the Glasnevin Botanic Garden, near Dublin, and were there raised by Mr. Moore, the curator. They speedily germinated, and attained a great size, but without flowering until early in the present year, when, towards the end of April, Mr. Moore kindly transmitted beautiful specimens, laden with flowers, to Sir William Hooker at Kew, to Dr. Lindley at the Horticultural Society, and to Dr. Balfour in Edinburgh. Both Dr. Hooker and myself took the opportunity of examining a considerable number of buds in various stages of development, as well as expanded flowers, but again failed in detecting any regularity or symmetry in the arrangement, even when the number of stamens, twelve or sixteen, was an exact multiple of that of the petals or sepals. Dr. Lindley indeed believed he had found traces of an arrangement in two distinct series, each double in number

to that of the petals and sepals; and Colonel Madden, in his description of the plant (Proceedings Bot. Soc. Edinb. 1855, p. 43), says that the stamens are "disposed in two or four sets." But upon a careful re-examination of a number of flowers, I cannot discover any such arrangement. The stamens, especially when numerous (never however more than sixteen in any flower I have opened), are crowded into a tuft surrounding the ovary, so that some three or four appear to be external, sometimes one opposite a petal, sometimes two side by side, but they are so dense that one can never say that two are nearer together than to the adjoining ones, and no one is really withinside another *at the base*. When the stamens are detached (and they fall off with the greatest facility when fresh), their scars form a single, *irregularly* waved line, at some distance from the ovary, and surrounded by a slightly glandular ring, waved and indented by the cavity left by each filament. This arrangement is particularly evident after the flower is fully expanded, and the filaments have more room to assume their natural position. To me therefore it is clear that the whole of the stamens belong, in this as in other *Cruciferae*, to a single verticil.

This view of the case would tend to confirm the most plausible of the modern theories of the morphology of *Cruciferae*—that one so clearly expounded by Messrs. Webb and Moquin-Tandon in the seventh volume of Hooker's 'London Journal of Botany,' and almost simultaneously by Dr. Asa Gray, in the first volume of his beautiful 'Illustrations of the Genera of North American Plants.' In a review of the latter work, inserted in the first volume of the 'Kew Journal of Botany,' p. 359, I did indeed object to the word *deduplication*, as including what is called *transverse duplication*, a principle which, as I then thought and still believe, it has been attempted to carry too far; yet I cannot but most cordially agree in the theory of collateral multiplication, as instanced in the two double stamens of *Cruciferae*, and in the much more divided ones of *Malvaceae*.* So also in the *Roogee*, all the stamens appear to me divided collaterally, so that two, three, or more occupy the place of a single one. They all would thus have their origin in a single verticil, want of space for their development forcing some of them

* I cannot however go so far as Dr. Gray in the supposition that the petals of *Malvaceae* are always opposite to the staminal leaves, and belong to the same verticil. In the European *Lavateras* at least, where the five staminal leaves may be easily traced, they surely alternate with the petals.

to the outside of the others. This is particularly necessary, considering the thick fleshy nature of the filaments, and indeed some abnormal displacement must be expected in a plant, the whole of whose vegetative organs indicate a general state of plethora.

The ovary and fruit are precisely those of the Russian *Megacarpæa*, excepting some slight specific variations in outward form. Dr. Lindley informs me that in a very young bud he found evidences of two abortive cells, one on each side of the fertile ovary. This is not unlikely to happen, but I have not been fortunate enough to discover any traces of them in any of the buds I opened.

In describing the seed of *Megacarpæa*, both Meyer and Ledebour make use of the terms "radicula ascendens." This expression, though perhaps theoretically correct, may, under the circumstances, lead into error. The ovules and seeds are not in this genus, as in the majority of *Cruciferae*, pendulous; but the funiculus is either nearly horizontal, or more commonly ascending, as well as the ovule and seed. The radicle commencing in *M. laciniata* from the extremity of the embryo furthest from the hilum, in the *M. polyandra* much nearer the upper end of the embryo, is accumbent along the upper edge of the cotyledons, and its extremity is turned *downwards* towards the hilum.

In the specific comparison of the two Himalayan *Roogees* with the Russian species, we observe the same thick roots and general character of habit, pinnately divided leaves, and paniculate inflorescence, and all of them flower in the early spring. The *M. laciniata*, inhabiting the dry and bare steppes of Southern Siberia, is seldom above a foot and a half high, with a dry and hard stem, the stiff divaricate branches of the panicle becoming spinescent at the tips; the whole plant is then easily broken off on a level with the ground, and, laden with its pods, is rolled over and over by the wind, and swept over hill and dale to immense distances. The two *Roogees*, *M. polyandra* and *M. bifida*, natives of the valleys of the Himalayas, at great elevations, are tall, vigorous, and succulent, attaining six or eight feet in height, and showing in every part a great redundancy of nutrition. Their flowers differ most from those of the Russian species in their petals and sepals, both of which are of a petaloid texture and a yellowish-white colour; both are broad, almost orbicular, the petals rather smaller than the sepals. In the *M. laciniata*, on the contrary, their colour is of a reddish-violet, the sepals somewhat herbaceous and oblong, the petals

twice as long, and very narrow. So it appears, at least from the specimens in the Hookerian Herbarium, received from Bunge and from Karelin, as well as from Ledebour's Plate 372 of his illustrations of the 'Flora Altaica,' although I cannot find that these fertile flowers have ever been described. Meyer, when he wrote the description for the 'Flora Altaica,' had only seen the minute sterile imperfect flowers, which come nearer to those of the *Roogee* in the shape of the petals and sepals, and it is probably after having written the description that he inserted the reference to the above-quoted plate. Ledebour, in his 'Flora Rossica,' copies this reference without further allusion to the flowers; and neither in the 'Flora Altaica' nor in the 'Flora Rossica' is there any reference to Plate 380 of the same illustrations, which gives a beautiful representation of the plant in fruit.

The stamens of *M. polyandra* have been already alluded to; the filaments are much thicker, and the anthers rather larger than in *M. laciniata*. In the *M. bifida* (of which however I have only opened two flowers) they are less numerous, and more like those of the Russian species. The ovary is rather more sessile in the Himalayan than in the Russian species. The structure of the pod is, as has been already observed, the same in all three, but the shape differs: in *M. polyandra* each half is more regularly orbicular than in *M. laciniata*, and horizontally spreading, the upper and lower edge being nearly similar; in the *M. bifida* the pod is scarcely at all emarginate below, the lobes are much elongated, and although spreading at first, are curved upwards as the pod ripens, leaving a very narrow sinus between them, and representing a flat silicle split into two to about two-thirds of its length. The structure of the seed is the same in all, except that the radicle is much shorter in the two Himalayan species, and especially in the *M. polyandra*.

Any further detailed description of *M. polyandra* is rendered unnecessary by those already given by Colonel Madden and Mr. Moore, in Dr. Balfour's above-quoted notice of the plant in the Proceedings of the Botanical Society of Edinburgh. I therefore merely subjoin its technical specific diagnosis, together with the character of the hitherto unpublished *M. bifida*.

Megacarpæa polyandra, Strach. et Winterb.; caule elato, foliis pinnatisectis, segmentis lanceolatis dentatis subincisis, panicula inermi, sepalis petaloideis petala superantibus, staminibus multiplicatis (10—

16), siliculæ apice basique emarginatæ lobis cum ala orbiculatis divaricatis.

Gathered by Captain R. Strachey at the glacier sources of the Pindor River, in Kumaon, and by Mr. Winterbottom on the Pargil Pass, upper glen of the Kishnagunga River, in Little Tibet, without however having been met with by Dr. Thomson or any other traveller in any intermediate locality. It very frequently happens that only one cell of the pod enlarges and ripens.

Megacarpæa bifida, Benth.; caule elato, foliis pinnatisectis, segmentis lanceolatis integerrimis, panicula inermi, sepalis petaloideis petala superantibus, staminibus submultiplicatis (7-11 ?), siliculæ profunde bifidæ lobis cum ala obovatis demum conniventibus.

Gathered by Mr. Winterbottom in the valley of Kishnagunga, at an elevation of about 7400 feet, considerably lower down than the *M. polyandra*, from which it differs in the leaves, whose lobes are (at least in the single specimen preserved) perfectly entire, in the much more slender pedicels, and especially in the form of the pod as above described. Each lobe, with its wing, is about fifteen lines long by nine or ten lines broad. The wing itself is from three to near four lines broad.

Plate IX. and X. *Megacarpæa polyandra*. Fig. 1. Flower. 2. The same with the sepals and petals removed, showing the stamens. 3. Stamens. 4. Ovary and receptacle: the scars and marks on the receptacle are however somewhat inaccurate. 5. Silicule. 6. Seed. 7. Embryo.

Botany of VICTORIA (Southern Australia). Extracts of Letters from
DR. FERDINAND MUELLER, Colonial Botanist, Victoria.

Arvon River, Gipps' Land, Nov. 19, 1854.

The interest which you formerly so kindly bestowed on my communications induces me to despatch from this locality, at the commencement of a new botanical journey to the Australian Alps, a few lines to you, to lay before you some results of my first ascent of the mountains this year. I am just returned from Mount Wellington (Gipps' Land); and although at so early a season for the snowy regions I had not an opportunity of collecting several apparently new and interesting plants even in the beginning of flower-development, yet I have seen, in addi-

tion to several new plants and several not yet found previously beyond Tasmania, others in a better state of development than before, so that I hope to be justified in addressing this letter to you.

Mount Wellington is rather more than 5000 feet high; and although *Podocarpus alpina* and some other truly alpine plants are found there, I think it may be safely considered more than subalpine, on account of its far southern situation. A heavy snow-storm at the middle of this month (equal to your May), which unfortunately shortened my explorations, called to my mind how far I was above the hot plains of Gipps' Land. But I will not trouble you with the detail of incidents of such journeys; I will merely enumerate a few of the most interesting plants which I met with on this mountain. The long-looked-for *Astelia alpina* I at length succeeded in finding, accompanied by *Veronica nivea* (out of flower), by a species of *Haplopappus* (perhaps identical with a Van Diemen's Land species), by a *Decaspora* with the habit of an *Acrotriche*, and distinct from Robert Brown's two kinds, and having a 5-10-seeded berry, so that it comes near *Pentachondra*. I noticed besides the beautiful little *Pimelea alpina* for the first time in flower, and seeing this plant exposed to snow at such a season, I could not help thinking what an acquisition it would be to the garden flora of England, reared without protection; and I will, of this as well as of the other alpine plants, collect at the proper season all the seeds I possibly can. The species appears to me very distinct from *P. humilis* in its smooth floral leaves, smallness of flowers, which are in various tints of red outside, with a white limb. But the gem of my new collection consists of an undescribed white-flowered *Ranunculus*, which, when shown to a botanist at home, would be rather considered as a plant from the Alps than from Australia, and it deserves for its typical similarity to the general feature of alpine plants (so rarely to be met with amongst those of Australia) so much attention, that I at once transmit to you specimens, with a brief diagnosis.

Ranunculus Millani; acaulis; folia glabra, pinnatisecta; segmenta linearia, obtusiuscula, indivisa vel dissecta; scapus solitarius, uniflorus, parce pilosus, petiolis glabrescentibus brevior; sepala appressa, glabra, margine membranacea; petala alba, 5-10, obovato-cuneata, calyce fere duplo longiora; styli subuncinati; carpidia . . .

On places denuded of grass on the summit of Mount Wellington, in Gipps' Land, at an elevation of about 5000 feet, where snow lies

during the greater part of the year. Flowers in November and December.

The root produces a fascicle of fibres. The leaves are expanded over the moist black soil, and are, with the petiole, from one to two inches long. The peduncle seldom rises to the height of one inch, and bears an elegant, tender white flower, rarely slightly yellow-tinged, which colour it however assumes in drying. Each petal is only provided with a solitary nectar-gland, and this character alone would separate my plant widely from *R. Gunnianus*, which grows in moist grassy places at the same locality. I have named this neat *Ranunculus*, the first new one which I observed in Australia, in honour of Angus M'Millan, Esq., who not only deserves this slight scientific tribute for the discovery of Mount Wellington, and of many other mountains which he named and first ascended, and which border one of the finest and most delightful districts of Australia, Gipps' Land, of which Mr. M'Millan, under extraordinary difficulties and dangers, was the first explorer, but also as I wished to acknowledge thus permanently my gratitude for much assistance which I received from him in my botanical journeys through this district.

Other plants new to me are, a very curious one, perhaps a *Kunzea*, with the habit of *Calluna vulgaris*; a leguminous plant, like *Templetonia retusa* (which latter I formerly found on Spencer's Gulf), both out of flowers and fruit; a broad-leaved *Celmisia*; a species of *Wilsonia*, apparently distinct from *W. Backhousei*; a dwarf *Leucopogon*, which I formerly saw from Van Diemen's Land, and met with here for the first time. *Leucopogon obtusatus* is abundant; *Gaultheria hispida* is scattered here and there, and descends sometimes to lower localities; the natives are very fond of its fruit. The plant which I called, in my second annual report, *Eriostemon phyllicoides*, proves, by its flowers, which I have observed for the first time, to be a *Phebalium*, and is one of the finest species of this ornamental genus. *Grevillea australis*, *Euryomyrtus alpina*, *Bossia distichoclada*, *Oxylobium alpestre*, *Hovea gelida*, *Ozothamnus Hookeri*, *Exocarpus humifusa*, *Eurybia megalophylla*, *Goodenia cordifolia*, *Celmisia asteliaefolia*, *Ranunculus scapiger*, *Geranium brevicaulis*, *Callistemon Sieberi*, *Hibbertia minutifolia*, *Brachycome nivalis*, *Symphyonura Filicula*, *Gentiana Diemensis*, *Mniarum biflorum*, a species of *Oreobolus*, *Lomaria alpina*, etc., all grow also on Mount Wellington. On the swampy table-land, about 4000 feet high, occur *Didiscus humilis*, *Ani-*

sotome simplicifolia, *Epacris heteronema*, *Myriophyllum simplicifolium*, *Pimelea ligustrina*, a species of *Andreaea* (unfortunately not found in fruit), and a *Patersonia*, which I shall call, as the only Irideous plant here to be found at such a height, *P. subalpina*: it appears to be quite distinct from *P. sericea*, a plant of the warmer parts of Australia; I saw only the decayed seed-vessels of it, whilst *P. longiscapa* and *P. glauca* are nearly out of flower in the lower country; the leaves are 4-6 inches long, ciliated, unequally streaked; the scape is half as long as the leaves, compressed upwards, and thickened, and throughout, with the spatha, silky-pubescent.

In the country between Melbourne and Mount Wellington I observed little of interest. Additions to my list were *Emex australis*, *Drosera spathulata*, *Chaetospora mniaroides*, *Gastrodia sesamoides*, *Pterostylis acuminata*, *Lecanora byssacea*, a *Chorizanthes* (growing out of the stems of the tree-ferns), a few additional Mosses, a splendid *Cassia*, which may be new, a pretty *Pomaderris*, with which as yet I am unacquainted, a *Lepidosperma*, probably distinct from *L. flexuosum*; a *Eurybia*; an excellent *Grevillea*, belonging to Section *Lissostylis*, forming a considerable bush, with flat, large, ovate leaves, downy beneath: this *Grevillea* is undescribed in Robert Brown's 'Prodrômus,' but perhaps exists amongst Sieber's or Cunningham's plants. Finally, I have yet to mention a *Daviesia*, almost intermediate between *D. latifolia* and *D. ruscifolia*, with heart-shaped, dark green, shining leaves, which are sessile and smaller than in *D. latifolia*, but participate in their bitterness (native Hop); the racemes are corymbose; it differs from *D. ruscifolia* in its leaves and twigs not being pungent: a kind of *Pleurandra*, perhaps distinct from *P. stricta*, and *Dillwynia parvifolia* grow alongside of it; all three are equally beautiful.

I am preparing now for an ascent of the Bogong mountain, which is probably higher than Mount Caskinsko, in New South Wales; it is at all events the king of the mountains in Victoria, and I trust that I shall be able to surmount the difficulties on the long way to it; it is the real centre of the Australian Alps, and I hope it will furnish me with many desiderata of the Tasmanian alpine plants, for which I have been hitherto looking in vain.

Botanic Gardens, Melbourne, April 26, 1855.

Being disappointed in getting all my alpine collections together by

this time, I have been unable to make up such a collection by the 'Red Jacket' as would have been worth sending to you; as this however is one of the regular clippers, I will not lose time in forwarding to you a few lines.

Professor Harvey, that excellent and learned man, will leave our shores in a day or two for Sydney, proceeding probably to Moreton Bay. You may imagine what pleasant hours I have spent with him. He supplied the Government collection and my own herbarium with a beautiful set of *Algæ*, and had the kindness to arrange my own, so that I have ample materials for working now and then a little at this interesting order of plants. We made also some selections of duplicates from my *Phanerogamæ* for the Dublin collection.

In a letter, which I despatched about a fortnight ago, I gave some additional information on the flora of the Alps, having subjected several of my plants to an analysis, viz. *Caltha Novæ-Zelandiæ*, *Boronia algida*, *Phebalium ovalifolium*, *Drapetes Tasmanica*, *Diplaspis Hydrocotyle*, *Ranunculus anemoneus*, *Euphrasia alsa*, *Drosera Arcturi*, *Ranunculus Mil-lani*, *Herpetolirion Tasmania?*, a new genus of *Umbellifera*, distinct from all in having ten petals, or rather five petaloid sepals = *Dichopetalum ranunculaceum*, *Pæderota densifolia*: there are, besides, a few other beautiful species, but I have not yet examined them.

Our botanic garden offered also two new plants this year: one, *Greevesia cleisocalyx*, was raised from seeds collected by Mr. Bunce, in the second expedition of the unfortunate Dr. Leichhardt: it is a most extraordinary genus of *Malvaceæ*, differing from *Pavonia* and the thousand other known species of the Order in having a *closed calyx*! which bursts only when the fruit becomes perfectly ripe: the little corolla *never* expands, and sees consequently *no* daylight until long after fecundation! The other is a herbaceous *Sesbania*, allied to *S. picta*, which, as the species mentioned by Sir Thomas Mitchell remained undescribed, I will call *Sesbania Australis*; Mitchell's plant however must be distinct, for mine is not allied to *S. aculeata*. I have been also fortunate enough to discover a third new genus of *Malvaceæ* on Lake King. I was at first reluctant to remove it from *Lagunea*; but the undivided style, with a trilobed, club-shaped stigma, the trilocular capsule, which encloses a slight quantity of free short hair, the habit of the plant, and what may seem extraordinary, the suppression of stipules, induced me to separate it as *Howittia trilocularis*. Lindley

unites *Bombaceæ* and *Sterculiaceæ*; still the former have one-celled anthers, as far as I see in your *Plagianthus sidoides*. He gives, as a general character, two-celled anthers; is that correct?

I have bought a set of Mr. Wilhelm's plants, collected this year in the Port Lincoln district; it contains but little novelty. The descriptions of the new species I have worked out, and transmit them to you; they may be published separately, as they comprise South Australian plants. The new genus *Pleuropappus* is most singular, and the occurrence of *Verticordia* so far east is also interesting. I shall send the set to you by the next mail-vessel, together with some alpine plants. I hope to be this year more fortunate than last with my new genera. I ascertained, by a careful examination, that *Psoraleopsis* is identical with *Lespedeza juncea*, Pers.

I also beg to enclose a list of plants which I am desirous to introduce into the colony. If your rich establishment could supply some of them, I should be delighted. An additional genus of *Laurineæ* occurs also in my new collection for the flora of Australia: its calyx is four-parted, but the plant was unfortunately so little developed, that it will be difficult to determine it. It is a noble tree, about 40 feet high.

By the next opportunity I intend to send, through a friend who is going home, *Azolla rubra* in a living state, and also all the Fungi which I possess, for Dr. Harvey tells me that Mr. Berkeley probably will easily determine and describe them.

My next report may possibly give the names of 400 additional species for the flora of this colony, more than 200 being *Algæ*, either from Dr. Harvey's or my own collection. Some of Dr. Harvey's novelties are magnificent.

*Botanical Notices on a Journey into the Interior of SOUTHERN AFRICA,
in company with Mr. Burke; by CHARLES L. ZEYHER.*

(Continued from p. 334.)

Our march the following day towards the Mooyerivier, which we intended to reach the same day, led us over grassy plains again, but which were bounded by little hills in various directions, numerous herds of Bur-chell's zebra racing over those flats, or gazing at our party at intervals as we passed by. We reached the river towards sunset, and observing

numerous kinds of birds near its banks, we bivouacked for the night close to it, on the opposite side, after having crossed that little permanent stream. The next morning offered ample chances for sporting; large coveys of *Pterocles gutturalis*, Smith, a kind of a Namaqua partridge, and the genuine *P. Namaquana*, being the principal partridges about here, and roaming over the fields adjacent to that river, came instinctively at a fixed hour in the morning to have a drink, of which we secured a vast number, as well for the collection, as for eating. Several kinds of herons, ducks, and geese inhabited the jungles of sedges, with which the banks of that river are girt.

We passed several farmhouses as we went on, lying on both sides of the road, up along the river, towards the new town "Mooyerivier," named from the river on whose banks it has been erected. Considerable tracts of ground on both sides of the little stream showed in their ample traces of the ploughshare, that the industrious white man had put his hand already into the soil of the wilderness, to demand tribute of her; and surely she paid abundantly to her new masters, in the granaries, filled up with corn. This tract having been only a few years previous within the dominions of Masilicatse, has been most likely very often a silent witness of carnage and cruelty, executed by the warriors of that despot.

Following the advice of the inhabitants, to provide ourselves with a considerable quantity of flour ere leaving the village, as it was unlikely to get any more of that necessary article after we left that place, we bought several muids of corn from the inhabitants, and waited for an opportunity of grinding it, at the only mill of the village,—rambling meanwhile over the neighbouring hills and dales in search for new objects of natural curiosity; the result thereof however was unsatisfactory, as we soon found out that the frost had killed many a plant; although they were already in seed, would have been even then a new acquisition to the botanical collections. There was many a new form of plants, which having grown luxuriantly during the summer months, bore witness now of the powerful effect of frost, especially those herbaceous plants belonging to a warmer and equally temperate climate; many of them were only stragglers, occurring occasionally here, as being their most southerly limit.

As the country about here is considerably elevated, the falling of snow would be no rare occurrence; but as the atmosphere contains very

little moisture during the dry winter season, the quantity of snow is very small, on account of want of moisture to be condensed in the atmosphere. It seems also, that the currents of air, carrying moisture from an equatorial climate towards the polar regions, have lost already their waters before they can reach the considerably elevated regions of the interior: those moist currents of air generally suspend and arrive during the winter months in lower regions, and on that account discharge their contents below the marks of elevation of a high continent, lying a considerable distance from the southern tropic line. The rainy season here commences, as in many other parts of South Africa, towards the middle of November, being the beginning of the summer, and occurs chiefly in the form of thunder-showers. It is difficult to decide if the fall of rain during the summer months, towards the elevated interior regions, is caused by currents of moist air returning from a tropical climate towards the polar regions, and that they hang in a much higher atmosphere during the summer months, and have no obstacles in their way during that time, to hinder their reaching those regions. Thunder-showers are very frequent, as soon as the rainy season has set in; they take place often every day, nearly for a whole week, as long as the atmosphere is impregnated with moisture, which becomes generally heated to a high degree by the effect of the powerful rays of a burning sun, until on a sudden, thunder-clouds accumulate, and torrents of rain burst forth from the clouds, which make the temperature moderate and agreeable.

A climate, as just now described, has a great influence on vegetation: it seems to be most favourable to the Natural Orders *Gramineæ* and *Cyperaceæ*; and many useful grasses are predominant, as well in these regions as over large tracts of countries lying between here and the colony. They turn dry as soon as the rainy season is over; but it is not likely that the usual degrees of cold in these parts should hurt these orders of plants. It is the custom of the natives here to set the fields on fire as soon as the grasses turn dry, a practice which is very annoying, on account of the dense smoke filling and darkening the atmosphere, which lasted for many weeks, and was a great hinderance, preventing our seeing any distant view. As the vegetation is very luxuriant, the grasses grow in many places to a considerable height, concealing often lions and other dangerous animals, which may reasonably inspire the natives to burn down the dried vegetation; and as

they have no cattle or other flocks which require pasturage, they do not mind the smoke, but have the advantage of finding many eatable roasted animals, after the fire has run over the fields, to satisfy their hunger. The rocky hills near the village bore a few stunted trees, and gave some diversity to our eyes, not accustomed to the monotonous aspect of a grass-like vegetation.

It was interesting to behold the traces of industry everywhere about that newly-erected village, in an uninhabited country, surrounded for hundreds of miles by a vast wilderness. The Dutch emigrants have commenced their agricultural and horticultural operations during the last three years, and have chosen very judiciously this place for the culture of wheat, on account of a prevailing cool climate during the winter months, being the season for growing this useful vegetable, as a native of a colder climate. The permanent running stream of water is required to moisten the acres of wheat during winter, when no rain falls to assist the growth of that plant. The village contains already many houses, which are built on both sides of the little stream; but the quantity of its water however may suffice to moisten many additional fields and gardens. The latter were planted already with various kinds of fruit-trees, as peach-trees, fig-trees, vines, etc., so that the kind inhabitants could even supply us with several sorts of their garden produce. We were glad, as soon as the corn was ground, to leave this place, and to proceed towards the north, as our people showed serious symptoms already of becoming intoxicated: they had found out already that somebody in the village sold brandy, and began to introduce that quarrel-causing medium, however secretly, into our camp; assurances of an everlasting friendship, and an undaunted aid in the hours of danger, were the beginning of the scene, ending at last with quarrelling and fighting.

There were still, even in the neighbourhood of the village, many fine water-birds, as *White Herons*, *Ducks*, and a very fine *Plover* (*Lobivanelus melanocephalus*), along the river, stalking over the swamps in search for food.

The street which we followed is the only principal one in that village, and is of considerable length, bending in a serpentine line, nearly parallel with the course of the river, and it lasted a good while before we reached the end of that place. A well-trodden waggon route, joining that little stream for its greater length up towards its source, brought

us in less than five miles close to that place, but without finding any additional flowering botanical object, except *Hæmanthus obliquus*, which is also a native of the Tambooki country near the "Windvogelberg;" its leaves resemble those of *Cyrtanthus obliquus*, and its flowers are white. It seems that a locality of alluvial deposit suits that plant, as it grows on both places in a loamy kind of soil, accumulated in the manner just now described.

The favourable locality, to bring the water of the spring over a vast tract of ground, which is an important circumstance here, as there falls no rain during the months of the winter, has induced the emigrants to erect a small village on the upper side of the spring, its houses being densely inhabited by the farmers, who were very kind towards us. The small village is called "Potgieter-stroom," named after Mr. H. Potgieter, being their principal leader of the division between Drakasberg, Vetrivier, and Mooyerivier. It happened that we met him here, residing at this place for a short period, with his wife and family. Although a man of simple manners, he is not wanting in ability as the patriarchal leader of a large body of his countrymen. He gave us an introduction to the Frontier Fieldcornets along the northern boundary of the country they inhabit, before we left him.

Although I have seen the large spring of the Kuruman, near Eitakoo, of which Professor Lichtenstein and Dr. W. Burchell, in their able writings, relate in an attractive manner the allegorical tales of the Bachapins, or Batlapins, residing near that spring on that missionary station, I do not hesitate to compare the remarkable spring of the "Mooyerivier" with that of the Kuruman, on account of its grandeur. Out of a yawning dark hollow of considerable breadth, and high enough to allow an entrance to that dark chasm with a torch, comes forth the crystal flood of that stream, running for several paces over loose stones, till it falls into a large and very deep basin, its surface being graced by a dense carpet of floating leaves of *Nymphæa*, No. 13, resembling in its leaves *N. scutifolia*, D.C.; but its flowers, which are coming forth in December, are larger than *N. scutifolia*, and of a whitish-blue colour.

The basin close towards the spring is nearly free from reed or sedges, but further on, when the water assumes the size and aspect of a lake, it is densely grown with a thicket of reed and other aquatic plants, which are still the haunts and cover of several hippopotamuses, of which

we observed frequently fresh traces. These jungles are likewise inhabited by many kinds of water-birds, amongst which is the graceful *Plo-tus Levaillantii*, or *Anhinga*, a noble-looking bird, generally swimming under water with its body, and showing his thin and long neck and head only above the surface. The graceful shape of its long slender neck gave rise to the Dutch name, "Slangenek duiker," or snake-neck duck, and as these birds inhabit also the "Berg River" near its joining the sea-water, within the limits of the Cape Colony, they are known to many of the inhabitants.

It happened that we met here I. G. S. Bronkhorst, an enterprising colonist, who accompanied some years ago H. Potgieter and other emigrants on an exploratory expedition towards Delagoa Bay, in search of a small party of their friends, who emigrated several years previous, and settled towards the country of Delagoa Bay, and whom they found there quiet, and in good health and prosperity. They left their relations and property on the banks of the Vaal River, when they commenced that journey, quiet and without any suspicion of danger; but when they returned homewards again, they found that many relatives and friends were slain during their absence by the arms of Masilicatse's warriors, and their flocks of cattle and sheep driven away by those savages. One son of Mr. I. G. S. Bronkhorst's, and some other youths of these emigrants, who were made prisoners, were taken with them as hostages; they were used by the savages as waggon-drivers, to conduct several of the captured waggons to Masilicatse's residence. Nothing authentic has been heard since of the fate of those unfortunate youths, which would kindle a spark of hope in the bosoms of the pitiable parents of ever seeing their children again.

A half-grown male Vlat Boar (*Phascochærus Africanus*, Desm.), which we bought from a farmer of this place, gave us some trouble the first time we started, it being very sultry that day, and the animal would not permit of being carried on one of the waggons. However, as he became better accustomed to the party, and entered into familiarity with our little band of dogs, the animal was much liked on account of his caressing manners and vivacity. Being however too active at the time when we halted, he would capsize pots and pans standing on the fire, and we were obliged to fasten him with a chain during that time. As the nights sometimes were considerably cold, we usually tethered him near the watch-fire, which he liked very much, and would soon dig

a hole into the ground large enough for his body, pressing himself close to the fire; he seemed much pleased when somebody covered him with a sheepskin, which he often would replace again when it shifted off him. Nothing could please that animal better than when he was liberated from his chain at the time we started: he would turn round like a wheel, often taking the lead, as soon as the dogs commenced racing after various kind of game, which were rambling about the fields in every direction. His mission was fulfilled before any of the dogs closed with the game; our swift hoggish racer had already broken the phalanx of antelopes, or quaggas, and joined our party again long before the dogs returned.

The commencement of our march was the ascent of a moderate elevated ground, the route leading through small groups of *Acacia*-trees of moderate size, during sultry weather, until we entered again the open and more level fields. We fell in during our march with small troops of the wild Vlat Boar, which were rambling amongst many other game at no great distance from the route, and gave sport both to our dogs and to the Hottentots, who had to conduct the horses, of which they made use against orders. The little swift runners however soon won the race, for they were soon lost out of sight, and the men returned with the horses covered with foam.

The custom of burning the grass down over the whole country gave it a very dreary and melancholy appearance. The natives had recently set fire to the fields, and all the country looked black; the rising of smoke gave ample signals that they still went on to destroy every blade of green, and made us aware of the danger that our oxen and horses would suffer under such a practice. The air, filled with smoke, made an impression to the mind far from pleasant, and we were glad to reach towards evening a suitable place in a valley, where there was something to eat for the animals, and where we could find some wood, as we halted for the night near some solid rocks, which were shaded by a number of evergreen wild Olive trees. The Dutch emigrants named this station "*Wonder-fontyn*," in allusion to the disappearance of a river of some importance, entering a rocky cavern some miles' distance higher upwards of the place, where we just spanned out. The natives state that the same river appears again on the surface about eight miles distance lower down. As it was our opinion first that the spring of the *Mooyerivier*, which we had left the same afternoon, re-

ceived its water from here, we were dissuaded by the statement of the natives, who tell us that the spring of the Mooyerivier originates its water also from a river which disappears in a similar way under the ground, but a considerable distance from our station, more towards the south-east. The muddy nature of the soil about here where we halted, and the apparent shape of the bed of a river, makes it credible that the same river which runs at present underground has flown formerly between the embankment of this valley. There were here and there only muddy ponds of water, inhabited by various kinds of water-birds, resembling the *sacred Ibis*, several kinds of herons, and some ducks.

The next day, May 29, brought us over a similar flat, where the vegetation had been burnt down, as we had experienced already the day before; and we arrived towards evening in a similar valley as the day before, being the dry bed, or the embankment of a river, but its waters running underground in the same way as the two others mentioned before, on account of which the emigrants adopted the name of "Tower Fountain," to the station where we halted again for the night. An uninhabited building, with the nearly obliterated traces of a garden, and some arable ground as cornfields close to the farmhouse, bore witness of the enterprising spirit of an emigrant family. They had evidently chosen this place before the country towards the north had been explored, and were living there as border colonists. However, the inmates most likely gladly left this place, as soon as the great mass of people entered a more northerly and milder climate, and changed this isolated and inclement place for a better one. On account of the considerable elevation of the country, the climate must be very unfavourable during rainy or cloudy weather; the falling of rain during winter is not sufficient to moisten the soil, and the intense cold during winter are obstacles hindering the pasturage from growing, so as to give subsistence to the flocks.

Several miles' travelling the following day over an elevated grassy plain, continually rising as we advanced, brought us near to a vast number of scattered stone-hills, crowned with many a fine tree of *Protea*, No. 1458, closely related to the well-known *Wagenboom*, or *Protea grandiflora*, and perhaps identical with that species. The route entered, after we had passed several of these stony hills, into a depressed spot, where a pair of the graceful *Grus carunculata*, a kind of a crane, rambling on our wayside, attracted our attention, as living also in these

remote countries. As we went on, the country assumed a hilly and broken appearance ; and descending between grassy hills, we arrived at last near the banks of a fine small stream, running in a deep valley from south towards north, and entering at no great distance from our present station into abruptly intersected mountain ravines. High but obtuse, ovate-topped mountains became visible in front of us, and inspired us with the hope that they were the promontory of the Magalis mountain range, for which we had longed for. We were agreeably surprised to meet two young couple of emigrants near the banks of the stream, where we encamped together for the night. They were, like us, on their way towards the country of the Magalis mountain-range, and gave us some useful information with regard to a tolerably good route, leading through the more intricate ranges of mountains, which were lying as a barrier before our way towards the more northern countries.

As long as we halted the next morning, a brindled gnou was shot by one of our people, it being the first time that we observed this kind of antelope during our journey, although their most southerly range goes as far as to the banks of the Vaal River. The last-mentioned animal, although resembling much the black gnou when seen from a distance, and to whom it is certainly the nearest related amongst the known species of antelopes, yet it differs in many points considerably from the black species, as well in the form of body, the manner of running, and in the colour of its body, that it is easy to distinguish at any distance, when they move, the one species from the other. Our party was pleased to taste for the first time a new kind of venison, and concurred in the opinion that its flavour was preferable to that of the black gnou. As these kind of antelope prefers the shade of forests, and as the general belief amongst the Cape Colonists is, that the venison of game living in the shade of forests, like the koodoo and the bushbok, has a better flavour than that of others living on open plains and exposed constantly to the burning rays of the sun during the day, it is not unlikely that similar habits in various kind of game produce that uniformity in flavour which is so much prized in wild venison.

(Our copy of Mr. Zeyher's Journal terminates here.)

Catalogue of MR. GEYER'S Collection of Plants gathered in the UPPER MISSOURI, the OREGON TERRITORY, and the intervening portion of the Rocky Mountains; by SIR W. J. HOOKER, D.C.L., F.R.A. and L.S.

(Continued from vol. v. p. 265.)

SANTALACEÆ, Juss.

1. *Comandra umbellata*, Nutt.—Hook. Fl. Bor. Am. vol. ii. p. 139. *t.* 179. *A.* *C. angustifolia*, Nutt. MSS.
HAB. Sterile declivities, Upper Oregon. *n.* 634.

ARISTOLOCHIEÆ, Juss.

1. *Asarum Hookeri*, Field. Sert. Plant. tab. xxxii. *A. caudatum*, Nutt. MSS. *A. Canadense*, var. β , Hook. Fl. Bor. Am. p. 139.
HAB. Low, shady alpine woods, Cœur d'Aleine Mountains. April.
—The natives use the stem as a spice, boiling it with their fish.
n. 598.

EUPHORBIACEÆ, Juss.

1. *Euphorbia montana*, Nutt.
HAB. Clayey hills of Upper Platte, with *Enothera cæspitosa*. June.
n. 261.
2. *Euphorbia maculata*, L.
HAB. Sunny, barren places, Kooskooskie Valley. July. *n.* 509.
3. *Euphorbia polygonifolia*, L.—Hook. Fl. Bor. Am. vol. ii. p. 140.
HAB. Slopes of Upper Platte hills, in denuded places, with *Atriplex argentea* and *Kochia dioica*. June. *n.* 167.
4. *Euphorbia hypericifolia*, Ph.
HAB. With the last.
5. *Euphorbia platyphylla*, L.—Hook. Fl. Bor. Am. vol. ii. p. 140.
HAB. Barren, rocky places, valley of Kooskooskie. June. *n.* 345.

URTICEÆ, Juss.

1. *Parietaria Floridana*, Nutt.
HAB. Indian camps, Kooskooskie Valley, rare. *n.* 382.

AMENTACEÆ, Juss.

1. *Salix pentandra*? L.

HAB. Banks of streams, Missouri territory, on the Lower Platte, and within the "Black Hills." 60-80 feet high. Branches declined.
n. 281.

2. *Salix pentandra*, L.

HAB. Borders of rivulets and around springs, Missouri and Oregon territories. 15-20 feet high, forming often impenetrable thickets.
n. 287.—The specimens are young, and appear quite to agree with the European *S. pentandra* rather than with *S. lucida* of Pursh and Willdenow, if indeed the two be really distinct.

3. *Salix rostrata*, Richard's App. to Frankl. Journ. p. 37. (Excl. syn. *S. phylicifolia*.)—Hook. Fl. Bor. Am. vol. ii. p. 147.

HAB. Borders of streams and rivulets, most abundant about springs. 10-15 feet high. n. 286.

4. *Salix grisea*?; ramis strictis rufo-brunneis, junioribus pubescentibus, foliis $1\frac{1}{2}$ -uncialibus brevissime petiolatis obovato-lanceolatis acutis supra subpubescentibus subter glabris glaucis margine ciliatis, amentis ante folia oblongis, squamis longe sericeis, ovario stipitato lanceolato arcte sericeo squamis duplo longiore, stylo glabro furcato ramis furcatis.

HAB. Thickets along rivulets, Columbia River Valley, near Fort Colville. 20 feet high. Shrubby. n. 636.

1. *Populus angustifolia*, James, in Long Exped. vol. i. p. 497.—Torr. in James' Rocky Mountain Pl.

HAB. Banks of streams, Missouri territory, on the Lower Platte, and within the "Black Hills." n. 281.—Tree 60-80 feet high; branches a little declined.—"This is the *Narrow-leaved Cotton-wood* of Lewis and Clark, who detected it at the sources of La Platte, mixed indeed with the common Cotton-wood, which it resembles in size and habit, but its trunk is smoother, and its branches more slender and flexile; and the leaves are very different."

1. *Alnus rubra*, Bong. Veget. Sitka, p. 44.—Hook. Fl. Bor. Am. vol. ii. p. 158.

HAB. Banks of streams, Upper Oregon, Clarke's River. September. Shrub, 10-12 feet high. n. 215.

CUPULIFERÆ, Rich.

1. *Corylus Americana*, Wahl.—Hook. Fl. Bor. Am. vol. ii. p. 160.

HAB. Valley of Upper Columbia, forming thickets. n. 635.

CONIFERÆ, *Juss.*

1. *Juniperus communis*, L.—Hook. Fl. Bor. Am. vol. ii. p. 165.
HAB. On the rocks of the Kettle Falls, Upper Columbia. *n.* 592.
2. *Juniperus occidentalis*, Hook. Fl. Bor. Am. vol. ii. p. 166. *J. excelsa*, *Ph.*, vix *Bieb.*
HAB. Deep defiles, mountains of Missouri and Oregon territories. *n.* 506.

MONOCOTYLEDONEÆ.

ALISMACEÆ, *Br.*

1. *Alisma Plantago*, L.—Hook. Fl. Bor. Am. vol. ii. p. 168.
HAB. Muddy margins of ponds, plains of Spokane River. July. *n.* 439.

AROIDEÆ, *Br.*

1. *Symplocarpus Kamtschaticus*, Bong.—Hook. Fl. Bor. Am. vol. ii. p. 169.
HAB. Miry rivulets, in deep, rich, vegetable mould under *Populus canadensis*. Abundant in Cœur d'Aleine River. April. *n.* 327.

SMILACINEÆ, *Br.*

1. *Smilacina racemosa*, Desf.—Hook. Fl. Bor. Am. vol. ii. p. 176.
HAB. Dry, alpine woods in the Cœur d'Aleine and Spokane Rivers. April. *n.* 329.
2. *Smilacina uniflora*, Menz.—Hook. Fl. Bor. Am. vol. ii. p. 175.
HAB. Shady, alpine woods, Cœur d'Aleine and Spokane Mountains. June. *n.* 528.
1. *Uvularia lanuginosa*, Pers.—Hook. Fl. Bor. Am. vol. ii. p. 174.
HAB. Low, shady, rocky woods, along Cœur d'Aleine and Kooskooskie Rivers. April. *n.* 611.
1. *Streptopus distortus*, Mx.—Hook. Fl. Bor. Am. vol. ii. p. 173. *t.* 188. *A.*
HAB. Shady, rocky woods, Cœur d'Aleine Mountains. May. *n.* 524.

MELANTHACEÆ, *Br.*

1. *Amianthium Nuttallii*, A. Gray. — Melanth. Am. Sept. p. 123.
Leimanthium Nuttallii, Hook. Fl. Bor. Am. v. 2. p. 177.
HAB. High plains and Gamass-prairies, Missouri and Oregon territo-

ries. June. *n.* 374.—Bulb highly nauseous. It is sometimes by mistake mingled with Gamass. When eaten, it causes excessive vomiting and convulsions. June. *n.* 374.

1. *Trillium petiolatum*, Ph.—Hook. Fl. Bor. Am. vol. ii. p. 180. t. 192.

HAB. Rocky, moist, fertile, and somewhat shady places along the foot of the mountains, valley of Cœur d'Aleine River. April. *n.* 291.

2. *Trillium grandiflorum*, Salisb.—Hook. Fl. Bor. Am. vol. ii. p. 180.

HAB. Deep, shady, fertile, alpine woods, Upper Oregon. May. *n.* 603.

LILIACEÆ, *Juss.*

1. *Fritillaria*? *pubica*, Spreng.—Hook. Fl. Bor. Am. vol. ii. p. 182.

Lilium pudicum, Ph. *Am. v.* 1. p. 288. t. 8.

HAB. Wet rocks, Upper Oregon, very abundant at the Kettle Falls of Upper Columbia, Fort Colville. March and April. *n.* 315.

2. *Fritillaria lanceolata*, Ph.—Hook. Fl. Bor. Am. vol. ii. p. 181. t. 193.

HAB. Fertile, grassy Pine-woods, valley of Cœur d'Aleine River. April. *n.* 599.

1. *Erythronium grandiflorum*, Pursh.—Hook. Fl. Bor. Am. vol. ii. p. 182.

HAB. Abundant in the Cœur d'Aleine Mountains, on gravelly slopes of the hills close to the valley. *n.* 601.

1. *Calochortus elegans*, Pursh.—Hook. Fl. Bor. Am. vol. ii. p. 183.

HAB. High, sunny, grassy bases of the Cœur d'Aleine Mountains. May. *n.* 299.

2. *Calochortus macrocarpus*, Dougl.—Hook. Fl. Bor. Am. vol. ii. p. 183.

HAB. Sandy Pine-woods and granite rocks, Spokane Country, Upper Columbia River. July, August. *n.* 618.

ASPHODELEÆ, *L.*

1. *Allium cernuum*, Roth.—Hook. Fl. Bor. Am. vol. ii. p. 184. *A. cernuum*, *Bot. Mag. t.* 1324.

HAB. Rocky banks of Spokane River, about the Falls also at the Columbia River and Fort Colville. June. *n.* 569.

2. *Allium acuminatum*, Hook. Fl. Bor. Am. vol. ii. p. 184. t. 196.

HAB. Stony banks of Kooskooskie River. The *Omoir* of the Nez Perce Indians. May. *n.* 226.

3. *Allium stellatum*, Fraser, Cat.—Hook. Fl. Bor. Am. vol. ii. p. 184. t. 194.

HAB. Slopes of the clayey hills, Upper Platte. May. n. 173.

4. *Allium campanulæflorum*, Geyer, MSS.

HAB. Fertile, inundated meadows, Upper Oregon. June—September. n. 584.

1. *Hesperoscordon Lewisii*, Lindl.—Hook. Fl. Bor. Am. vol. ii. p. 185. t. 198. A.

HAB. On the open tableau of the Cœur d'Aleine Mountains, in rocky, exsiccated basins. July. n. 437.

1. *Camassia esculenta*, Lindl.—Hook. Fl. Bor. Am. vol. ii. p. 186.

HAB. High, fertile plains in wet tracts. Almost the only plant in the wet, undulated portion of Cœur d'Aleine River. The chief food of the Flathead tribes. May. n. 628.—Flowers blue and white.

1. *Triteleia grandiflora*, Sm.—Hook. Fl. Bor. Am. vol. ii. p. 186. t. 198. B.

HAB. High plains and their rocky slopes, between Spokane and Kootenai Rivers. The farinaceous bulb used as food by the Indians. April. n. 289.

JUNCÆ, Juss.

1. *Luzula comosa*, E. Mey.—Hook. Fl. Bor. Am. p. 183.

HAB. Dry, rocky woods, Upper Oregon. May, June. n. 318.

1. *Juncus castaneus*, Sm. (var. *pallidiflorus*).—Hook. Fl. Bor. Am. vol. ii. p. 192.

HAB. Ravine of the Platte River, growing in water. n. 13.

2. *Juncus polycephalus*, Mx.—Hook. Fl. Bor. Am. vol. ii. p. 100. J. Rostkovii, E. Mey.

HAB. Gravelly, inundated places, banks of Upper Clarke and Flathead Rivers. September. n. 208.

3. *Juncus xiphioides*, var., E. Mey.

HAB. Shady, boggy meadows along rivulets, Spokane and Nez Perce country. July, August. n. 498.

4. *Juncus aristulatus*, Mx.

HAB. Stony borders of rivulets, Spokane plain. July. n. 499.

ORCHIDÆ, Juss.

1. *Calypso borealis*, Sal.—Hook. Fl. Bor. Am. vol. ii. p. 195.

HAB. Deep, shady Pine-woods in the Cœur d'Aleine and Nez Perce Mountains, with *Linnaea borealis*, etc.; "flowers turned strictly towards the east." May. *n.* 307.

1. *Platanthera foetida*, Geyer, MSS.

HAB. Moist, grassy, shady plateaux of Spokane Mountains. July. Fetid. *n.* 534.

2. *Platanthera hyperborea*, Lindl.—Hook. Fl. Bor. Am. vol. ii. p. 197.

HAB. Shady willow thickets, Upper Platte and Sweet-water Rivers, in dry mould. July. *n.* 233.

1. *Spiranthus decipiens*, Hook. Fl. Bor. Am. vol. ii. p. 203. t. 204. *Goodyera Menziesii*, Lindl. *Orchid.* p. 492.

HAB. High, dry, alpine woods, Cœur d'Aleine Mountains. July. *n.* 595.

1. *Cypripedium parviflorum*, Salisb.—Hook. Fl. Bor. Am. vol. ii. p. 205.

HAB. Mountain slopes, highlands of the Nez Perce Indians, near Salmon River, about 300 feet below the line of perpetual snow. June. *n.* 534.

IRIDEE, *Juss.*

1. *Sisyrinchium grandiflorum*, Doyle.—Hook. Fl. Bor. Am. vol. ii. p. 207.

HAB. High, stony plains of Upper Spokane, near the Cœur d'Aleine Mountains. May. *n.* 311.

CYPERACEÆ, *Juss.*

1. *Elæocharis obtusa*, Roem. et Schultes.—Hook. Fl. Bor. Am. vol. ii. p. 229.

HAB. Stony places in swamps, Kooskooskie Valley. July. *n.* 494.

1. *Scirpus sylvaticus*, L.—Hook. Fl. Bor. Am. vol. ii. p. 230.

HAB. Swampy, springy meadows, Kooskooskie Valley. July. *n.* 493.

2. *Scirpus lacustris*, L.—Hook. Fl. Bor. Am. vol. ii. p. 229.

HAB. Shady, boggy meadows, thickets of Kooskooskie Valley. July. *n.* 500.

1. *Cyperus filiculmus*, Vahl, Enum. vol. ii. p. 328.—Torr. Fl. p. 63.

HAB. Stony borders of Kooskooskie River. July. *n.* 510.

2. *Cyperus inflexus*, Mühl.—Hook. Fl. Bor. Am. vol. ii. p. 232.

HAB. Gravelly and muddy exsiccated borders, banks of Spokane River. July. *n.* 455.

1. *Carex Douglasii*, Boott in Hook. Fl. Bor. Am. vol. ii. p. 213, t. 214.
HAB. Gravelly banks of Laramie and Horse Rivers, of the Upper Platte; also in the Upper Colorado. July. n. 54.
2. *Carex festiva*, Dewey.—Hook. Fl. Bor. Am. vol. ii. p. 215.
HAB. Swampy prairies among willow thickets, highlands of Nez Perce Indians. June. n. 417.
3. *Carex straminea*, Schk.—Hook. Fl. Bor. Am. vol. ii. p. 215.
HAB. Wet meadows along rivers, Kooskooskie Valley. June. n. 503.
4. *Carex Jamesii*, Torrey. C. compacta, R. Br. Hook. Fl. Bor. Am. v. 2. p. 220.
HAB. Saline swamps of the Platte, growing with *Triglochin maritimum*. July. n. 48.
5. *Carex incisa*, Boott, MSS. nov. sp. Differt a *C. scabrata*, Schkuhr, perigyniis lævibus, etc., squamis fœmineis viscidis, etc.—F. B.
HAB. Rich mould; thickets of the fertile plains above Colville.
6. *Carex Houghtonii*, Torrey, var.—Hook. Fl. Bor. Am. vol. ii. p. 223.
HAB. Swampy prairies along willow thickets, highlands of Nez Perce Indians. June. n. 416.
7. *Carex Richardsonii*, Br.—Hook. Fl. Bor. Am. vol. ii. p. 223. t. 223.
HAB. Dry, stony, shady slopes of mountain woods in the Cœur d'Aleine country. May. n. 333.
8. *Carex Pennsylvanica*, Linn.—Hook. Fl. Bor. Am. vol. ii. p. 223.
HAB. On the fertile grassy plains between Kansas and Platte River. May. n. 73.
9. *Carex lanuginosa*, Mx.—Hook. Fl. Bor. Am. vol. ii. p. 223. C. pellita, Muhl.
HAB. On the fertile grassy plains between Kansas and Platte Rivers. May. n. 72.
10. *Carex aurea*, Nutt.—Hook. Fl. Bor. Am. vol. ii. p. 226.
HAB. Thickets in springy meadows, Upper Oregon and Missouri territories. July, August. n. 190.

GRAMINEÆ, Juss.

1. *Alopecurus aristulatus*, Muh.—Hook. Fl. Bor. Am. vol. ii. p. 233.
HAB. Stony, loamy, exsiccated pools, Gamash prairie of the Cœur d'Aleine. May. n. 323.
1. *Hierochloa borealis*, Rœm. et Schultes.—Hook. Fl. Bor. Am. vol. ii. p. 234.

HAB. Stony, mossy borders of Cœur d'Aleine Lake. April. n. 320.

1. *Phalaris arundinacea*, L.—Hook. Fl. Bor. Am. vol. ii. p. 234.

HAB. Banks of rivulets in meadows, Upper Oregon. August. n. 216.

1. *Panicum viscidum*, Elliott.—Hook. Fl. Bor. Am. vol. ii. p. 236.

HAB. Stony banks of the Kooskooskie and of Sweet River. June, July. n. 475, 491.

1. *Stipa Sparta*, Trin.—Hook. Fl. Bor. Am. vol. ii. p. 237.

HAB. Sandy valley of Lower Platte; sparingly over the Upper Columbia and Spokane-river Valley. June, July. n. 146.

2. *Stipa membranacea*, Ph. Kunth. *Eriocoma cuspidatum*, Hook. Fl. Bor. Am. v. 2. p. 237.

HAB. Scattered over the whole range of desert of Missouri territory. June, July. n. 23.

(To be continued.)

On two new Umbelliferous Plants from the Alps of South-eastern Australia; by DR. FERDINAND MUELLER, Government Botanist for the Colony of Victoria.

(Plates XI. and XII.)

DICHOPETALUM, n. g. Hydrocotylearum.

Char. Gen. Flores hermaphroditi. Calycis lobi albi, membranacei, petaloidei, petalis conformes, decidui. Petala sessilia, ovato-elliptica, apice non inflexo, obtuso. Stamina petalis breviora. Styli divergentes. Stylopodia crassa, subulata. Fructus immaturus a dorso compressus?, subovatus; mericarpia quinque-juga, evittata. Carpophorum indivisum.—Herba prostrata, perennis, acaulis, hispida, Alpes Australiæ incolens. Scapi aphylli. Folia longe petiolata, subrotunda, 3-5-loba, lobis inciso-crenatis. Umbellæ paucifloræ, simplices vel subcompositæ; involucri magno, triphylo, foliolis basi sæpe concretis. Flores albi, quasi decapetali, antheris atro-rufis. (TAB. XI.)

1. *Dichopetalum ranunculaceum*, Ferd. Mueller.

HAB. In locis glareosis nive deliquescente irrigatis et circa fontes Alpium Australiæ,* alt. 5-7000 ped., e. g. Munyang Mountains.—Anth. æstatis initio.

* A very similar species has been found on the Alps of Tasmania by Mr. Milligan.
—ED.

Radix crassa, fasciculato-ramosa vel subsimplex. *Petioles* 1-3" longi, basi vaginantes, et scapi setulis sæpe ramellosis sparsis hispidi, necnon pilis stellatis parcissime conspersi. *Folia* numerosa, $\frac{2}{3}$ -1 $\frac{1}{3}$ " longa et lata, herbacea, parcius quam petioli hispida, prope basin rotundatam vel leviter emarginatam integra, medio et antice plus minusve 3-5-fida, lobis obtusis profunde et irregulariter crenatis. *Scapi* petiolorum longitudine. *Involucris* foliola 2-3, inæqualia, disjuncta vel interdum in cupulam basi coalita, hispida, oblonga, integra, vel ovata et rotundata, tunc lobata, semper basi dilatata, umbellis æquilonga vel breviora. *Umbellæ* simplices, pedicellis inæqualibus setuligeris 1-4" longis, vel compositæ, radiis pluribus uncialibus et brevioribus umbellulam illi simplici persimilem et similiter involucatam gerentibus. *Calycis* tubus 1-1 $\frac{1}{2}$ " longus, cujus margini repando insident lobi (sivis sepala) sesquilineam longi, scilicet petalis alterni et staminibus oppositi, uninerves. *Petala* calycis lobis tam forma et magnitudine quam consistentia, structura, et colore exacte æqualia! *Antheræ* ovato-rotundæ, subdidymæ, e rufo nigrescentes, $\frac{1}{4}$ " longæ, dorso affixæ: *filamenta* petalis dimidio breviora. *Styli* additis stylopodiis vix 1" longi. Plantam fructiferam nondum reperi.

This well-marked genus is allied to *Xanthosia* and *Oschatzia*, but differs from both and from all other genera of the order in the large deciduous membranous calyx-lobes, which so entirely resemble the petals that at first sight the flower appears to be 10-petalous.

Plate XI. Fig. 1, bud; 2, flower; 3, petal; 4, unripe fruit; 5, transverse section of ditto:—*all magnified*.

MICROSCIADIUM.

Microsciadium cuneifolium, Ferd. Mueller; radice perenni, caulibus herbaceis erectis, foliis cuneatis 3-9-nerviis apice 3-9-dentatis vel laciniatis, floribus paniculatis, petalis glabris, fructibus subovatis leviter compressis, mericarpiis 5-costatis. — *Pozoa cuneifolia*, F. Mueller in Transactions of the Victoria Institute for 1854, 1855. — *Centella cuneifolia*, F. Muell. MSS. et Herb. (TAB. XII., sub nom. *Centellæ cuneifoliæ*.)

HAB. In sphagnetis alpinis montium Cobboras-mountains, 6000 ped. elevatione.—Anth. æstate.—*Herba* pedalis vel humilior. *Folia* crassiuscula, unciam vel sesquiunciam longa, apice 3-9" lata, in petiolum bi-quadripollicarem sensim angustata, venis anastomosantibus ner-

visque subtilibus percursa; laciniae dentesve nunc acuti nunc obtusi. *Caulis* nudus, superne in pedunculos satis distantes varie longos solutus. *Umbellulæ* paucifloræ, non raro ad florem unicum reductæ. *Bracteolæ* tot quot flores, lineari-subulatae, interdum incisæ. *Pedicelli* fructu plus minusve longiores. *Calyx* breviter 5-dentatus. *Petala* alba, oblongo-ovata, satis firma, saltem lineam metientia. *Fructus* cum stylopodiis crassis lineas duas longi, stylis reflexis coronati, ad commissuram leniter contracti.

Plate XII. (under the name of *Centella cuneifolia*). Fig. 1, bud; 2, flower; 3, petal; 4, fruit nearly mature; 5, transverse section of ditto:—*all magnified*.

BOTANICAL INFORMATION.

MR. SPRUCE'S ascent of the Amazon to Peru.

Letters have been received from the indefatigable explorer of the Amazon and its tributaries, Mr. Spruce, who writes from Yurimagua, on the Rio Huallagua, in the Maquas province of Peru. Mr. Spruce is on his way to Tarapoto, at the eastern base of the Andes, a country partially, indeed, explored by the German traveller, Poeppig, but one that no doubt affords a magnificent harvest to the botanist.

DR. F. MUELLER'S appointment to be Botanist to the North-west Australian Expedition.

The venerable Drummond having, on account of his great age, declined to accompany the Expedition to the Victoria River, our readers will learn with great satisfaction that Dr. Ferdinand Mueller, the Colonial Botanist of Victoria, has accepted the appointment of Botanist to the North Australian Exploring Expedition, which Mr. Gregory is about to conduct. A person better qualified for the position it would be difficult to find, for to great botanical acquirements and indefatigable zeal in collecting, observing, and studying, Dr. Mueller unites all the requisites of an experienced Australian explorer. For several years past the completion of the flora of South-eastern Australia has been the main object of Dr. Mueller's travels and studies; the materials for this

have most prudently been prepared in duplicate, and transmitted to Kew, so that in case of any unforeseen event hindering the completion of this work by Dr. Mueller himself, the invaluable fruits of his labours will not thereby be lost to science.

We shall eagerly look for further news from our indefatigable and talented correspondent, and communicate it at once to the public through the pages of this Journal. With still greater pleasure shall we look forward to the termination of his expedition, when it will doubtless be desirable that he should return to Europe, for the publication of his Victoria flora, with the fruits of the expedition upon which he is now starting.

Note on the Application of BRITISH RUSHES in Sussex; by W.

BORRER, Esq., F.L.S.

I have been examining our "manufacturer" as to what plants he makes use of in his various rush-fabrics, and he tells me he has used—

Hard Rush	<i>Juncus glaucus</i> ;
Soft Rush	„ <i>effusus</i> ;
Hollow Rush	„ <i>conglomeratus</i> :

all the three for mats, the last two for chair-bottoms, and the Soft only in two modes of preparation for burning. He knows of no implement for preparing this but the human fingers. He has made, but not of late years, little dusting-brooms of the *Polytrichum commune* ; and he has seen a "handsome" mat of a long sort of it that grows in the forest. He never made one of these, but can, if he "come across" the material.

I think it is more than half a century ago that I have seen these "Silk Brooms." A member of my family, who grew up in the barbarous region of the Sussex coast, and is thus but a denizen of these more advanced parts, says she never saw one.

The "Rush-lights" were formerly in very common use among our farm-house servants and the labourers. Now they are almost obsolete, but still, I am told, to be found in a few farm-houses.

I have ordered a sample of each of the articles mentioned above, as soon as the season admits. The Rushes for burning I expect to have in a few days. I will not forego the honour of contributing to the Royal Museum.

W. B.

Note on the proposed Genus FITCHIA of Dr. Meisner.

At page 75 of our present volume it will be seen that Dr. Meisner, under an impression that his *Grevillea? cynanchicarpa* will probably form a new genus, has suggested that it should be called *Fitchia*, "in honour of the well-known artist, whose numerous drawings in many of the best botanical works of England are not less admirable for scientific accuracy than for artistic skill and elegance;" but it is stated in a note by the Editor, that Dr. Hooker had already dedicated a very distinct Composite genus of plants to Mr. Fitch, in the 'London Journal of Botany,' Vol. IV. p. 640, t. 23, 24.

Dr. Meisner, on being made aware of this, proposes for the Proteaceous genus in question the name of *Molloya*, "in compliment to Mrs. Molloy, of the Swan River Colony, to whose zeal the British Herbaria are indebted for many valuable communications."

NOTICES OF BOOKS.

FOLIA ORCHIDACEA; by Professor LINDLEY, F.R.S. Parts VI. and VII.

The fifth and sixth Parts of this valuable work, completing the first volume, are now published, and are chiefly occupied with the extensive genus *Oncidium*, a very few pages sufficing for *Calanthe*, *Limodorum*, and *Geodorum*. We have elsewhere expressed our high opinion of the preceding numbers of this most important and laborious undertaking, and have to add that the present parts are in every respect worthy of their author. It is not too much to say that Dr. Lindley is the only living botanist capable of monographing the *Orchideae*, and that in doing so he is conferring an inestimable benefit on botany as well as horticulture. The difficulties of the task are so many and so great, that it requires something more than talent, knowledge, and a long familiarity with the plants themselves in a living and dried state to surmount them; it requires above all this more patience and skill in dissection, more tact in appreciating morphological characters, and more unwearied application in endeavours to unravel synonymy and to understand the enigmatical descriptions of spurious botanists, than

any other Natural Order of plants whatever. We have no hesitation at all in saying that the *Orchideæ* are the most difficult group, of any extent, in the vegetable kingdom, and that it is a matter of congratulation to botanists that Dr. Lindley should have taken them up in the present form. We may add that it is a disinterested contribution to science, and we fear a very costly one to the author.

Of the genera treated, *Calanthe* contains thirty-eight species, most of them natives of India, and nearly one-half of the Himalaya mountains. Several are Japanese, one only is American, one ranges from India to Port Jackson, one inhabits the Society Islands, and another the Mauritius and South Africa. *Limatodes* contains five species, all Indian; *Geodorum* nine; all, but one Australian species, are Indian. Of the fifty-two species contained in the above genera, fifteen were previously undescribed.

The elaboration of the genus *Oncidium* is however in every respect the *magnum opus* of these Parts, and is alone a monograph of the utmost use. Whether we consider the number of species in cultivation or the state of confusion the genus was in, both in our books and herbaria, it is a work of very great labour and application, and could hardly have been accomplished but for the author's talent for drawing; this enabled him to sketch, under the microscope, the important characters taken from the labellum, especially of many specimens of each species, that were steamed and softened for the purpose, and to weigh the characters at leisure. One hundred and ninety-eight species are described, divided into fourteen sections; of this great number only about a dozen are described as new, which is the best assurance not only of the author's knowledge of the literature of the Order, but of the skill and care with which it is worked up; for we need hardly say that there is a host of new habitats given, and new amended characters to old species, and a great reduction of spurious ones. It is in the investigation of such large genera as this, of the variability of whose species we have abundant proof in every stove forced daily upon our notice, that the intelligent systematist often pauses to consider whether the characters he draws from one or other class of organs are the most constant, and in this case he is tempted to ask at times whether any are. Dr. Lindley does not avoid this most disheartening point in his studies, but meets it boldly and well. He says, "In some of the sections, whether artificial or natural, into which *Oncidium* is

here divided, the limits of the species are clearly definable ; in others it is "extremely doubtful whether some which the author still retains ought to be admitted as anything more than forms of one common type, as, for example, among the *Plurituberculata*. It will also be found that supposed species are absolutely reduced without hesitation to an extent which the author once thought improbable ; but many months' very careful critical re-examination of all the copious materials at his command leaves no doubt upon his mind that at least those supposed species which are now cancelled ought never to have been elevated to that rank ; he must, however, add that the badness of materials, the imperfection of drawings and descriptions, and the misinformation so common in gardens concerning countries, have rendered such errors unavoidable, even if no account is taken of the haste with which a botanist working without leisure must necessarily act."

Throughout the monograph we meet with similar expressions of caution and philosophical treatment of the subject ; and above all, we have to admire the candid manner in which the author speaks of his own groups and sections. Some of these, though indispensable to the determination of the species, and the result of the most painstaking analysis and study, being after all pronounced wholly artificial.

We need hardly say that the author's habit of never throwing his words away is of the most essential value in a work of this kind. The descriptions are remarkably clear and terse, and there is no attempt in the English remarks to dilate upon trifles, or to give a fictitious value to a doubtful species, by over-describing organs that vary in every specimen : this gives an appearance of brevity to the diagnoses and descriptions, which however, when applied to the specimens, prove to be ample and lucid as well as accurate and skilfully drawn up.

In acknowledging with his accustomed eagerness the assistance he has received from others in the elaboration of *Oncidium*, Dr. Lindley pays a well-merited compliment to Professor Reichenbach, jun. :—"He would add, that in the revision of this genus his thanks are not only due to his usual correspondents, but most especially to Professor H. G. Reichenbach, jun., of Leipzig, a most acute and experienced orchidologist, without whose invaluable assistance it would have been impossible to form an opinion concerning many species published by Continental writers."

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HOOKER'S
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AND

KEW GARDEN MISCELLANY.

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KEW GARDEN MISCELLANY.

Definitions of Rare or hitherto Undescribed AUSTRALIAN PLANTS, chiefly collected within the boundaries of the Colony of Victoria; by Dr. FERDINAND MUELLER, Government Botanist for the Colony of Victoria.

At the moment of Dr. Mueller's departure on the Exploring Expedition to North-west Australia, we have the pleasure to receive from him the following descriptive characters of some of his many interesting discoveries. These have indeed appeared in the 'Transactions of the Victoria Institute and of the Philosophical Society of Victoria, 1854-5,' but as that work is likely to fall into the hands of few European botanists, we are anxious to do all in our power to make these discoveries known to them. It is more than probable that when the plants here defined come to be compared with the collections in our extensive Herbaria in this country, some of them will be found to be already described; but that must be a work of time. In the meanwhile, we give the account in the Author's own words.—ED.

I. RANUNCULACEÆ.

1. *Ranunculus Millani*, F. Muell.; dwarf, stemless; root fasciculate-fibrous; scape simple, one-flowered, solitary, spreading-downy, of the length of or shorter than the petioles; leaves pinnatisect, glabrous or,

together with the upper part of the petioles, scantily downy; segments few, linear, undivided or bi-trisect, terminated by a gland; sepals appressed, glabrous, nearly ovate, with membranous margins; petals five to ten, white, obovate to oblong-cuneate, almost twice as long as the calyx; nectar-pit distant from the base, margined, covered by a hardly perceptible scale; carpels few, glabrous, broad-ovate, compressed, margined, smooth, with a hooked style.

HAB. In gravelly places on most of the summits of the Australian Alps, irrigated by the melting snow.

I should have referred this neat little plant to the Tasmanian *R. nanus*, were the discrepancy in the colour of the petals, a character of such validity in this genus, not too manifest; for whilst to that species bright yellow petals are attributed, I found them always white in this, and assuming only a slight yellow tinge when drying.

In selecting the specific name, I desire to pay a slight tribute to the scientific merits of A. McMillan, Esq., who not only forced with skill and enterprise his way first into Gipps' Land, opening one of the finest districts in the whole of Australia to civilization, but also named and ascended Mount Wellington, where I became originally acquainted with this plant.

2. *Ranunculus anemoneus*, F. Muell.; glabrous or hirsute; root fasciculate; stem thick, simple, erect, one- to three-flowered, below leafless, at the base vaginate; leaves veined, the radical ones on long and strong petioles, orbicular, divided to the base into three or five lobes, these deeply three- to five-cleft, covering each other, their lobules variously cut, acute; bracteal leaves large, cordate-orbicular, dissected, sessile, clasping; peduncle naked, or with a smaller bracteolar leaf; sepals five to seven, ovate, appressed, slightly villous; petals large, white, generally numerous, twice or three times as long as the calyx, narrow oblong-cuneate, entire; nectar-pits solitary, margined; carpels turgid, even, glabrous, margined; the style hooked at the extremity.

HAB. On springs at the summit of the Munyang Mountains.

This charming and interesting species forms, after *Grevillea Victoriae*, Muell., the greatest ornament to the snowy mountains of continental Australia. It differs from the similarly showy species of New Zealand in its white petals, and approaches rather to the European alpine type of the genus represented by *R. aconitifolius*, *glacialis*, etc.

3. *Myosurus Australis*,* F. Muell.; scape filiform or setaceous, upwards but slightly thickened; petals and sepals very small; fruit-spike narrowly terete, somewhat acute, about an inch long; carpels numerous, closely intricate, rhomboid or almost deltoid, acuminate at the thickened base, slightly spreading; styles very short.

HAB. On moist places or on the open plains where rain-water lodges for a considerable time, near the Emu Creek, Hopkins River, Avoca, Avon, Richardson, and Murray, sometimes abundant.

It is not a little surprising that this genus, of which hitherto only two species, namely, *M. minimus* from Europe, and *M. aristatus* from the Cordilleras of Chili, have been noticed, should find its representative also in Australia. Our species is closely allied to *M. minimus*; it differs chiefly in the loose extra-curved bases of the carpels.

4. *Caltha introloba*, F. Muell.; dwarf; leaves on long petioles, has late-ovate, notched at the summit, perfectly entire, enlarged at the base by two long lobes; these bend inward, are oblong-linear and dilated below; scape one-flowered, very short; sepals white, five to eight, deciduous, linear-lanceolate, acuminate; carpels five to nine, with three seeds in each, and a long straight style, reflexed at the top.

HAB. On gravelly places on the Australian Alps, irrigated during the summer months by the melting snow. Mount Hotham, Mount Latrobe, and Munyang Mountains.

Distinguished from *C. Novæ-Zelandiæ* principally by its white flowers and longer leaf-lobes. It is the only known New Holland species.

II. CRUCIFERÆ.

5. *Cardamine laciniata*, F. Muell.; perennial, erect, glabrous; leaves nearly all radical, on long petioles, lanceolate, remotely toothed or lacinate or sometimes pinnatifid; flowers in the raceme remote; petals oblong-cuneate, hardly twice as long as the sepals; siliques as well as their pedicels spreading; style short; seeds brown, slightly wrinkled.

HAB. On moist grassy as well as on boggy places, along rivers and creeks; it often indicates a saline soil.

6. *Cardamine eustylis*, F. Muell.; dwarf, glabrous or somewhat downy; root creeping; stem thin, upwards naked; leaves petiolate, pinnatisect; segments five to seven, ovate or oblong, lobulate or with a few teeth, the terminal one the largest, the inferior ones narrowed

* Apparently not different from *M. minimus*, L.—ED.

into the base ; pedicels at length remote, spreading ; petals shorter than the calyx ; style longer than the diameter of the spreading siliqua.

HAB. On moist sandy places on the Murray River, in South Australia.

Not unlike *C. sarmentosa*, Forst.

7. *Sisymbrium* (§ *Arabidopsis*) *cardaminoides*, F. Muell. ; annual, diffuse, somewhat hairy ; leaves lanceolate, entire or on both sides with one or two teeth ; pedicels expanded, hardly half as long as the siliqua ; nerve of the valves thin ; petals white ; filaments linear-subulate ; style short ; stigma indistinctly bilobed.

HAB. On sand-ridges near the entrance of the Murray River.

8. *Sisymbrium trisetum*, F. Muell. ; suffruticose, glabrous, erect ; leaves glaucous, divided into three linear, filiform segments ; pedicels thread-like, three or four times shorter than the siliqua, slightly spreading ; style very short or wanting ; stigma dilated.

HAB. In the desert on the Murray River, on Spencer's and St. Vincent's Gulf, and near Lake Torrens.

9. *Capsella* (§ *Hutchinsia*) *antipoda*,* F. Muell. ; annual ; stems simple or little branched, ascending, foliate ; leaves all petiolate, pinnately parted or entire, glabrous ; lateral lobes two or three on each side, ovate or oblong, the terminal one larger ; petals white, ovate, unguiculate ; calyx for some time persistent, half as long as the corolla ; silicles elliptical, shorter than the pedicels, 4-12-seeded ; stigma subsessile.

HAB. In the Black Forest, and on the summit of Mount Alexander. Of great affinity with *Hutchinsia petraea*.

10. *Lepidium* (§ *Dileptium*) *ambiguum*, F. Muell. ; perennial ; stem upright, branched, somewhat scabrous ; upper leaves linear, entire or with a tooth at the apex and with a broad basis, sessile ; flowers furnished with petals ; silicles of the length of the pedicels, ovate-oblong, attenuated at the apex, with a very short emarginature, which includes the subsessile stigma.

HAB. On the Murray River in South Australia. Allied to *Lepidium hyssopifolium* ; silicles two lines long.

11. *Lepidium* (§ *Lepia*) *monoplocoides*, F. Muell. ; perennial ; stems upright or ascending, branched, scabrous from small papulæ ; leaves

* Probably *H. petraea*, which is found both in South-eastern Australia and in Tasmania, or *H. Australis*, H.f. Fl. Tasman.

linear, entire, slightly tapering into the base; flowers without petals; silicles orbicular, acuminate, with a broad keel, a little longer than the flat pedicel, their lobules connivent, surpassing in length the style.

HAB. In the Mallee Scrub on the Murray River, towards the junction of the Murrumbidgee.

A rare species, almost intermediate between *Lepidium* and *Monoploca*.

12. *Monoploca leptopetala*, F. Muell.; fruticulose; branches numerous, scabrous; leaves semiterete; petals lanceolate-linear, long acuminate; silicles ovate, of equal length with the pedicel; their lobules at the extremity connivent, half as long as the style.

HAB. In the Murray desert, not unfrequent.

13. *Stenopetalum* (§ *Camelinella*) *sphærocarpum*; glabrous; stems filiform; lower leaves of the stem tripartite, their segments and the upper leaves linear, entire; pedicels filiform, nodding, longer than the calyx; petals white, exceeding with its linear curled appendage twice the sepals; silicles globose, nerveless, hardly of the length of the pedicel; each cell containing from six to eight seeds; funicles shorter than the seeds.

HAB. On moist sandy places on the Murray River, at Lyndoch Valley, Crystal Brook, and various places on Spencer's Gulf.

14. *Blennodia alpestris*, F. Muell.; perennial, dwarf; stems erect, nearly naked, thinly pubescent, rarely branched; leaves lanceolate or ovate, toothed or nearly entire, gradually tapering into the petiole; flowers white, corymbose; style short; pedicels divaricate, of the length of the siliqua; valves distinctly one-nerved; seeds disposed in two rows, brown, minutely foveolate.

HAB. In subalpine grassy places at the sources of the Murray and Snowy Rivers.

Erysimum brevipes, *curvipes*, *blennodes* (*B. lasiocarpa*, MSS.), are congeners of this plant, but as the cotyledons are at times slightly bent inward, I am uncertain whether the genus ought not to be united with *Diplotaxis* or *Moricandia*.

III. DROSERACEÆ.

15. *Drosera angustifolia*,* F. Muell.; stem foliate, simple, decumbent or ascending; leaves scattered, nearly sessile, long and narrow, caudate, above and along the margins glandulose-pilose; racemes either

* Apparently the same as *D. serpens*, Planch.—ED.

opposite to or alternate with the leaves, hardly of their length; three- to ten-flowered, covered with short, gland-bearing hairs; segments of the five-parted calyx lanceolate, gradually narrowed upwards, about equal in length with the capsule, and half as long as the whitish petals; styles three, divided at the base, its divisions filiform, incurved at the top; seeds egg-shaped, clathrate.

HAB. On the moist gravelly margins of the lakes on the Murray River, towards Eustone.

This is the first extratropical species of this section of *Drosera* with which we are acquainted. It approaches *D. Finlaysoniana*, from Cochin China. This is however only one of many tropical forms of plants which, transgressing the torrid zone, advance as far south as the Murray Desert.

IV. POLYGALÆ.

16. *Polygala veronica*,* F. Muell.; stem suffruticose at the base, erect or diffused, nearly terete, hardly branched, as well as the peduncles and pedicels puberulous; leaves alternate, close to each other, soon smooth, the lower ones ovate or round, the upper ones lanceolate, acute, apiculate, net-veined, on very short petioles, and with a slightly recurved margin; racemes lateral and terminal, few-flowered; middle bracteole ovate-lanceolate, longer than the lateral ones, but much shorter than the pedicel; exterior sepals spreading, the interior ones ovate, contracted into a cuneate base, blunt, apiculate, glabrous, veined, of the length of the crested keel, and likewise of the roundish, obcordate, broad-winged, glabrous capsule; ovary tapering into a very short stalk; seeds ovate, sparingly hairy, twice the length of the strophiole.

HAB. In grassy or gravelly places, from King River to the Goulbourne River.

It is remarkable that since Brown noticed, in the Appendix to Flinders' Voyage, the presence of the genus *Polygala* in Australia, no Australian species has until now been described.

17. *Comesperma* (§ *Disepalum*) *polygaloides*,† F. Muell.; smooth; leaves approximated, flat, narrow or linear-lanceolate, acute, glaucous; raceme somewhat dense, purple; pedicels shorter than the flowers; lateral bracteoles about half as long as the intermediate one; lobes of

* Allied to some Asiatic species.—ED.

† Apparently very nearly allied to *C. virgata*, Lab.—ED.

the anterior sepal acute; carina gibbous at the top, hardly shorter than the wings.

HAB. In barren plains at the Avoca, Guichen Bay, and Encounter Bay. In habit approaching to *C. æmulum*.

V. PITTOSPOREÆ.

18. *Marianthus bignoniaceus*, F. Muell.; innovations silky; branches climbing, slightly pubescent, at length smooth; leaves patent, petiolate, out of an almost heart-shaped base, ovate, oblong or lanceolate, apiculate, net-veined, puberulous, above soon turning smooth, slightly hairy beneath; margins undulate, revolute, densely hairy, as well as the nerves; pedicels axillary, solitary or in pairs, rarely tribracteolate at the base, equal to or twice the length of the petiole, pubescent as well as the calyx; flowers pendulous; sepals lanceolate, acuminate, four or five times shorter than the cylindrical, somewhat bell-shaped, puberulous, orange-yellow corolla; anthers yellow; germen villous, silky; capsules narrow-elliptical, somewhat compressed, with a longitudinal furrow, bilocular, villous; cells many-seeded.

HAB. On shady rivulets, by cataracts, and in fissures of the rocks, in the Grampians, and Victoria and Serra Ranges; in South Australia, on the Onkaparinga, and in the Lofty Ranges.

This remarkable and beautiful species extends the geographical limits of the genus *Marianthus* to the eastern portion of this continent, and is the only one hitherto known from beyond the boundaries of Western Australia. At the Grampians it is accompanied with other features of the Swan River flora, as species of *Lepidobolus*, *Lhotskyia*, and *Calectasia*, not previously observed so far towards the east.

VI. CARYOPHYLLÆ.

19. *Colobanthus pulvinaris*, F. Muell.; perennial, glabrous; stems numerous, moss-like, tufted; leaves densely crowded, rigid, squarrose, broad, subulate, channelled, triquetrous, pungent, shining, with a slightly inflexed mucro; sheaths close; flowers solitary, terminal, on very short and thick peduncles, pentamerous: sepals from a broad base lanceolate-subulate, hardly longer than the egg-shaped capsule, and nearly twice as long as the stamens.

HAB. On the highest and barest gravelly tops of the Munyang Mountains (6000-6500 feet).

This forms a near approach to *C. Benthamianus*, Fenzl. (*C. subulatus*, Hook. fil.), a native of Cape Horn and the Falkland Isles, though not found either in New Zealand or Tasmania, but is apparently identical with the pentamerous form of *C. Benthamianus* from Campbell's Island. Since also my plant invariably shows a quinary division of the flowers, I have separated it from the South American one, following Dr. Hooker's suggestions* in the 'Flora Antarctica,' p. 247.

VII. MALVACEÆ.

New genus: *GREEVESIA*, Muell.—*Calyx* closed, at the full maturity of the fruit expanding into five segments, surrounded by five shorter lanceolate spreading bracteoles. *Petals* five, much shorter than the calyx, twisted, never expanded, adnate to the tube of the stamens, and concealed by the calyx. *Anthers* five, ovate, kidney-shaped, one-celled; pollen-grains obliquely ovate-spherical, echinulate. *Styles* ten, dilated into convex, at length penicillate, stigmas. *Carpidia* five, perfectly free, net-veined, indehiscent, one-seeded, oblique-ovate, slightly keeled. *Seeds* kidney-shaped, smooth, filling the cell.

This highly remarkable genus, which has been dedicated to Dr. Aug. Greeves, one of our warmest supporters of science, is as distinct from *Pavonia*, to which it ranks next, as from all other genera of this Order, and is well distinguished by its extraordinary character of covering with its perfectly connate sepals the little twisted corolla, which therefore does not see daylight until shrivelled up, and long after fecundation, when at length the calyx unfolds to set free the ripe carpels.

20. *Greevesia cleisocalyx*, F. Muell.

HAB. Discovered in eastern tropical Australia during Dr. Leichhardt's exploring expedition, by Mr. D. Bunce, and now cultivated in the Botanic Garden at Melbourne.

A small shrub, with oblong or ovate-cordate crenate leaves, which are covered underneath with a grey tomentum.

New genus: *HOWITTIA*, F. Muell.—*Calyx* five-cleft, without an involucre, shorter than the petals. *Stamens* numerous, all separately emerging from the tube. *Anthers* kidney-shaped, one-celled. *Pollen-grains* globose, scabrous. *Styles* three, connate into one. *Stigma* club-

* The suggestion is no more than a question whether the tetramerous and pentamerous forms of this *Colobanthus* have not as good a title to be considered species, as *Spergula saginoides* has to be separated from *Sagina procumbens*.—ED.

shaped, three-lobed. *Capsule* sessile, depressed, with three valves and three cells; valves bearing the septum in the middle; cells two-seeded, including at the top a slight quantity of woolly hair. *Axis of the capsule* persistent, thread-like. *Seeds* obovate, three-sided.

This new Malvaceous genus, which bears, in acknowledgment of his devotion to botany, Dr. Godfrey Howitt's name, is nearest related to *Lagunæa*, less to *Fugosia*.

21. *Howittia trilocularis*, F. Muell.

HAB. On bushy declivities around Lake King.

A flexile shrub, attaining the height of twenty feet; leaves ovate or oblong-lanceolate, with a heart-shaped base, above scabrous, beneath tomentose; stipules never distinctly developed; peduncles axillary, solitary, filiform, single-flowered; petals obovate, purplish.

22. *Sida intricata*, F. Muell.; fruticulose, upright or diffuse, much branched; leaves small, ovate-roundish, truncate at the top, toothed, but entire at the cuneate base, above scantily, beneath densely covered with grey stellate hairs; petioles much shorter than the leaves, often surpassing in length the subulate setaceous stipules; peduncles axillary, solitary, drooping, shorter than the leaves; segments of the calyx subdeltoid; carpels five, a little depressed, on the back almost even and puberulous, at the commissura netted; seeds brown, puberulous.

HAB. In sandy, loamy plains between Mount Hope and the Murray, also towards the Darling River.

This bears some affinity to *Sida corrugata*, but its growth is upright and intricate; it is much more robust, the flowers, leaves, and capsules are much smaller, the latter not rough.

23. *Sida humillima*, F. Muell.; suffruticose, procumbent; leaves thin, ovate-oblong, obtuse, cordate or rounded at the base, unequally and deeply crenate, above scantily, beneath densely covered with a stellate, somewhat shining indument; petioles hardly the length of the leaves, but longer than the subulate-linear stipules; peduncles axillary, solitary or two or three together, filiform, articulated near the middle, nearly equal to the length of the petiole; segments of the calyx subdeltoid, acute; carpels eight to ten, depressed, rough, at the commissure asperous; seeds brown, smooth.

HAB. In dry plains on the Avoca and Murray. In South Australia, on St. Vincent's Gulf, and the Kapunda.

Not dissimilar to *Sida corrugata*.

24. *Abutilon Behrianum*, F. Muell.; stem herbaceous, upright, hardly branched, as well as the leaves covered with a velvet-like toment; leaves cordate, acuminate, repand or slightly crenate, about as long as the petiole; stipules linear-subulate, deciduous; peduncles axillary, solitary, one-flowered, or terminal with several flowers, articulated above the middle, often shorter than the petiole; segments of the calyx ovate-lanceolate, acute; carpels nine to twelve, tomentose-pubescent, compressed, oblique, ovate, aristate, with two to four black somewhat scabrous seeds.

HAB. In lagoons which become dry, and on the margins of lakes on the Murray, Loddon, Darling, and Murrumbidgee rivers.

25. *Abutilon otocarpum*, F. Muell.; fruticose, upright, all over grey-velutinous; leaves cordate-orbiculate, blunt, unequally crenate, of nearly equal length with the petiole; stipules linear, subulate, deciduous; peduncles axillary, solitary, one-flowered, towards the top articulate, but little surpassing the length of the petioles; segments of the calyx inflated, cymbiform, long-acuminate; carpels numerous, shorter than the calyx, very compressed, ear-shaped, nearly membranaceous, velutino-pubescent, with one to three black glabrous rough seeds.

HAB. Very rare, on sand-hills on the Murray, towards the junction of the Darling.

This *Abutilon* is allied to *A. halophilum* (F. Muell. in Linnæa, xxv. p. 381), from Spencer's Gulf.

VIII. BUETTNERIACEÆ.

26. *Thomasia petalocalyx*, Schlecht.

This is the *T. macrocalyx* of Schlechtendal (Linnæa, xx. p. 633), not of Steudel. Hispid with starry hairs; leaves petiolate, oblong, entire, blunt on the summit and rounded on the base; stipules large, foliaceous, oblique, ovate or half-cordate; racemes lateral, simple, few-flowered; segments of the hypocalyx bracteole lanceolate; petals five or wanting; germen short-downy, pointed; style glabrous, as long as the anthers, which are at the top short-dehiscent; capsule three-celled.

HAB. On coast rocks of Wilson's Promontory, on scrubby places of the Bugle Ranges, and on the Gawler and Murray Rivers. The first species known from the eastern portion of Australia.

27. *Lasiopetalum Behrii*, F. Muell.; leaves coriaceous, narrow-oblong,

obtuse, above at length perfectly smooth, beneath covered with a velvety grey-brown toment; cyme few-flowered, about as long as the opposite leaf; basilar bracteole linear, the upper one tripartite and half as long as the calyx, with unilateral linear scarcely unequal segments; laciniae of the calyx outside starry grey-hairy, inside smooth, ovate-lanceolate, acute; germen blunt, white velutinous.

HAB. In the Mallee Scrub on the Murray River and St. Vincent's Gulf, where it was at first observed by Dr. H. Behr.

28. *Corethrostylis Schulzenii*, F. Muell.; leaves thin, cordate, somewhat acute, above asperulous, beneath grey-green and thinly tomentose; cyme about as long as the opposite leaf; bracteoles linear-filiform, undivided, solitary, the upper one a little remote from the calyx, which is whitish, almost membranous, marcescent and not spotted; petals opposite to the filament, smooth or outward hairy; germen white from glandless velvet hair; style, with exception of the summit, densely retro-pilose.

HAB. In the Salt Flatt at Guichen Bay and on Mount Benson.

Intermediate between *C. membranacea* and *C. cordifolia* from the western coast of Australia, to which part of the country the genus was formerly considered to be restricted.

(To be continued.)

DR. FERDINAND MUELLER and the NORTH AUSTRALIAN EXPLORING EXPEDITION.

In our last, or December Number of this Journal, we briefly mentioned the appointment of Mr. Mueller as Botanist to the above-mentioned Expedition. This judicious measure originated, we believe, with his Excellency the Governor-General of Australia, Sir William Denison, and a more fortunate choice could not have been made.

The exact destination or particular route of the party is probably known to few, save the Commander of the Expedition; but at a meeting of the Geographical Society, held on the 10th December, a letter was read from Mr. Kent, dated Sydney, August 12th, 1855, giving information respecting the North Australian Expedition, which had left Moreton Bay in August last, in a barque and a schooner. It was

under the command of Mr. Gregory, accompanied by his brother and by Messrs. Baines, Wilson, Mueller, Elsey, Hood, and fourteen men, with fifty horses, two hundred sheep, and provisions and stores for two years. Sir R. Murchison explained the projected course of this Expedition from Moreton Bay, by sea, to the mouth of the Victoria River, on the north-west coast. It was intended to ascend that river to its source, and determine the boundaries of the drainage towards the north coast to the interior. The Expedition, passing eastward, would probably skirt the northern limits of Sturt's Central Desert, and reach the head-waters of the rivers flowing into the Gulf of Carpentaria: thence it was hoped that it would be in a condition to penetrate, southwards, to the great head of the Boreo River, which was the northernmost point reached by Sir T. Mitchell and Mr. Kennedy, on their journeys from Sydney towards the Gulf of Carpentaria. These operations would greatly enlarge our knowledge of Northern Australia, and open up communication between it and the Southern Colonies.

Our first notice of the appointment of Dr. Mueller was from himself, as will be seen from the following extract of his letter to us, dated "Sydney, 12th July, 1855."

"This will probably be the last letter which I shall have the honour of addressing to you for a long time, since I have now definitely accepted the appointment of Botanist for the North Australian Expedition. I have accepted this appointment reluctantly, and only after his Excellency the Governor-General had expressed his opinion, that through your influence I might be permitted to retain a set of specimens to be formed during the Expedition, in order that I might describe what we may be able to add to botanical science. I sincerely trust that you, Sir William, will not let me pray in vain; for when I say that it would have been in my power to discover many hundred new plants in the meanwhile on the borders of the *settled* districts of Australia, without engaging in an expedition of such eminent dangers and privations, and that my fixed appointment in Victoria will probably render it difficult for me to visit England for the purpose of describing my collections, then I think you will agree with me in viewing my request as a just one; and I feel convinced, from former kindness which I experienced from you, that you would not wish I should sink to the position of a mere collector.

"I am so multifariously occupied with arrangements, that I can

add but little to this request; I will however state, that in case of my death I have made arrangements for my own private herbarium and collections, and the manuscripts of the Flora of Victoria, to be forwarded to England for publication."

Dr. Mueller's most just and reasonable request to be allowed to have a full set of his specimens for his especial use has been forwarded to us by the Colonial Office; and the Chief Secretary of the Colonies has not failed to grant his sanction to so modest a request from a true man of science, as Dr. Mueller is.

A second letter on this subject from Dr. Mueller,—showing that even in the environs of Sydney, in the midst of the bustle of preparation for a long and hazardous journey, he can collect information, if it be only in relation to the geographical limits of Australian plants,—will afford some interesting extracts. It is dated "On board the Monarch, off Moreton Bay, July 22, 1855."

"In a former letter addressed to you, I had only time to inform you that I was on leave of absence for eighteen months, without support from the Victoria Government, to resume my labours in Melbourne at the beginning of 1857. My favourite plan was to traverse, at my own expense, the interior districts of Eastern Subtropical Australia in the meanwhile, when I hoped to advance a little further our knowledge of Australian plants. Since however my private resources are reduced to almost nothing, I accepted the appointment as Botanist for the North Australian Expedition, which his Excellency the Governor-General had been pleased to confer upon me. Still I am far from expressing herewith, that financial reflections influenced me to embark in an expedition into tropical Australia. In fact it has been with very great reluctance that I accepted the appointment, dangerous as it is, not only with regard to our personal safety, but also perhaps to my position as a botanist. For if in any degree a comparison will be drawn between the results probably arising from botany in this expedition, and those which are generally gained in tropical peregrinations, I feel sure that I shall by no means satisfy your expectations. The scanty means of carrying the collections, the well-known hostility of the natives, and above all the aridity of the country, are likely to be so many obstacles in accumulating large collections of plants; nor can the share of new plants be great, if we are not able to reach elevated mountains in the interior, as the coast vegetation is already so well known through Robert Brown

and Allan Cunningham. It is however my utmost desire to get together as much of the treasures of the North Australian Flora as I possibly can; and I trust only that Providence will grant me life and health to bear the tropical heat, and the privations and fatigues which are inseparable from such journeys of discovery.

"I left Melbourne in the beginning of this month, and might have collected at that favourable season hundreds of plants in the environs of Sydney; but as only a few days were allotted to me for making my preparations, I was almost entirely deprived of the pleasure of botanical wanderings over the classical ground traversed by Banks and Solander and Robert Brown, where so much extensive information may be gained by studying the plants on the places where they were first discovered; and although you are so closely acquainted with every one of them, I think I may venture a few remarks on the specimens which I gathered in a walk on the north shore and along Botany Bay; for to any one who only saw the Flora of Victoria or South Australia, the increase or the diversity of *Epacrideæ*, *Diosmeæ*, *Proteaceæ*, *Restiaceæ*, and *Cyperoideæ* must be striking; nor can he fail to be surprised by the paucity of *Compositæ*. This remark can however only apply to the near vicinity of Sydney, for Mr. Moore, from whom I have gained much valuable information and manifold assistance during my brief stay, informs me that *Composite* are abundant to the westward, as may be reasonably expected. A large proportion of the plants, described at the beginning of this century, I saw for the first time then; and should the Flora of Victoria ever be continued by myself, it will be highly interesting to proceed from Sydney to Cape Howe, in order to trace the southern limits of many of the New South Wales plants. The boggy nature of the country, between the Snowy River and Cape Howe, frustrated my attempt to go so far east from Victoria. Of all natural orders in Australia *Diosmeæ* and *Proteaceæ* produce the most restricted plants as regards localities. Thus, all the following I had, for the first time, an opportunity of observing here:—*Zieria pauciflora*, *revoluta*, *Boronia ledifolia*, *B. pinnata*, *Oreoclea saligna*, *Eriostemon salicifolius*, *E. laxifolius*, *Philotheca*, *Conospermum longifolium*, *C. laxifolium*, *Iso-pogon anethifolius*, *I. anemonifolius*, *Petrophila pedunculata*, *Lomatia silaifolia*, *Xylomelum pyriforme*, several very fine *Grevilleas* and *Per-soonias*, *Hakea gibbosa*, etc. The examination of these plants has not been without use to me; for instance, I found that my *Zieria pauci-*

flora, from Mount Maridon, differs from the true species, and may be named *Z. oligantha*. Also the *Leucopogon lanceolatus*, from Sydney, is distinct from *L. lanceolatus*, from Mount William (*L. neurophyllus*); but these discrepancies are not to be recognized by the perusal of the respective diagnoses. Touching here upon some alterations to be made in the names of former plants of my collections, I may at once also observe, that I had the good luck to review an incomplete set of Sir Thomas Mitchell's plants from tropical Australia, under care of Mr. Moore. *Eriostemon rhombeus* is identical with *E. gracilis*, Ferd. Muell. (an Graham?); the name is however hardly applicable to the general forms of this curious plant. *Conospermum Dallachii* appears to be your *C. sphacelatum*, and has therefore a range from subtropical Australia to beyond 38° S. To return to my Sydney plants, I may mention, as apparently rarer species, *Phyllanthus scaber*, *Monotaxis* sp., *Micranthemum ericoides*, *Hemigenia purpurea*, *Lycopodium laterale*, *Drosera spatulata* (exceedingly rare in Victoria), *Mitrasacme polymorpha*, *Epacris purpurascens* (never seen in South Australia or Victoria), *Aristida ramosa*, *Prasophyllum striatum*, *Pterostylis acuminata*, *P. concinna*, *Acianthus fornicatus*, *Cyrtostylis reniformis*, *Lagenophora pachyrhiza*, *Leptomeria acida*, *Leucopogon appressus*, *Styphelia longifolia*, *S. viridiflora*, *S. tubiflora* (this is really a charming bush), *Xerotes flexifolia*, *Leucopogon microphyllus*, *Darwinia fascicularis*, *Tetratheca ericæfolia*, *Polycarpon alsinifolium*, *Lasiopetalum ferrugineum*, *Marsdenia suaveolens*, *Callicoma serrata*, *Ceratopetalum*, *Angophora*, etc.

"The Cyperoideæ and Grasses were to me very interesting. *Carphe deusta*, which exhibits such singular structure, I dissected with pleasure. *Chorizandra spherocephala*, *Chaetospira paludosa*, *C. turbinata*, and others, I had never seen before. Amongst a few Grasses received from Richmond River, I observed *Sporobolus elongatus*, *Panicum Crusgalli*, *Cenchrus Australis*. *Galinsoga parviflora* is now also an Australian plant, being a troublesome weed in the gardens of Sydney.

"The Norfolk Island Pines in the Sydney Botanical Gardens are truly deserving admiration. Amongst the many fine trees of that establishment, I must not fail to notice the finest of all *Proteaceæ* which I know, namely *Stenocarpus Cunninghamii*, a small tree, embellished in this season with its superb flowers.

"I have lately seen what I take to be the true *Goodenia hederacea*; it widely differs from *G. cordifolia*, which I think, as being truly

alpine (a rare occurrence in the Order), deserves publication, unless De Vriese's new monograph should include it already.

"By the last Sydney mail I had the pleasure of forwarding a reprint of the botanical articles printed in 1854 and 1855 by the Victorian Institute and the Philosophical Society. Another copy will be brought to Kew by Mr. Winter. In the article on the alpine plants I omitted *Eurybia alpicola* and *E. megalophylla*, both not less beautiful than distinct. By the 'Francis Henty,' from Melbourne, I forwarded last month a complete set of specimens, including the *Duttonia*, which you promised to figure. A box was sent before by the 'George Marshall,' under care of a friend, Mr. Balfour Steward. Of the safe arrival of the sundries, per 'Great Britain,' I am anxious to hear. Any communications, please let be directed to C. Moore, Esq., Sydney Botanical Gardens, who will forward them to me, as my return to Melbourne may be uncertain for some time.

"My next letter to you will be despatched from the Victoria River, as the transport vessel is leaving us there to sail for Singapore, of which opportunity I will avail myself to report on my botanical results about Moreton Bay, and to give a sketch of the place of our disembarkation, such as the first impression may be able to convey.

"The third year's Report is with the Government, but not yet printed. Professor Harvey will return from his cruise in about a month.

"FERD. MUELLER."

Catalogue of MR. GEYER'S Collection of Plants gathered in the UPPER MISSOURI, the OREGON TERRITORY, and the intervening portion of the Rocky Mountains; by SIR W. J. HOOKER, D.C.L., F.R.A. and L.S.

(Continued from vol. vii. p. 378.)

1. *Sporobolus littoralis*? Kunth. *Vilfa tenacissima*, Hook. Fl. Bor. Am. v. 2. p. 239, not *H.B.K.*
HAB. Sandy tracts, valley of Upper Platte. June, July. n. 188.
2. *Sporobolus Virginicus*, Kth. Agrost. p. 210. Agrostis, L.
HAB. Stony, barren places along rivulets and in dry watercourses, plains of Spokane and Pelouse Rivers. July. n. 556.
1. *Agrostis laxiflora*, Richardson.—Hook. Fl. Bor. Am. vol. ii. p. 240.

HAB. Crevices of granite rocks in the water, Spokan River. July.
n. 572.

2. *Agrostis Cornucopiæ*, Fras. Kth. Agrost. p. 221.

HAB. Moist, fertile meadows of Upper Clarke River, and Spokan Plains, Oregon. September. n. 86 and 355.

1. *Calamagrostis Canadensis*, Beauv.—Hook. Fl. Bor. Am. vol. ii. p. 240.

HAB. Meadows, Black's Fork, Upper Colorado. August. n. 28.

2. *Calamagrostis stricta*, Beauv.—Hook. Fl. Bor. Am. vol. ii. p. 240.

HAB. Grassy slopes, under Pine-trees, Spokan Mountains. July. n. 527 and 180.

1. *Spartina polystachya*, Willd.—Hook. Fl. Bor. Am. vol. ii. p. 242.

HAB. Fertile borders, Platte Fork of Upper Colorado, near Fort Vasco, rare. August. n. 259.—Saline, clayey, exsiccated places, valley of Upper Platte. June. n. 187.

1. *Deschampsia cæspitosa*? Beauv.—Hook. Fl. Bor. Am. vol. ii. p. 242.

HAB. Wet rocky prairies, on the high plains of Upper Oregon. June. n. 568.

1. *Aira elongata*, Hook. Fl. Bor. Am. vol. ii. p. 243. t. 227.

HAB. Rocks and stony swamps, and sides of rivulets, Kooskooskie Valley. June. n. 342 and 490.

1. *Danthonia spicata*, DC.—Hook. Fl. Bor. Am. vol. ii. p. 1244.

HAB. Rocks in the mountains of Upper Sweet-water, fringing the crevices; also in Platte and Upper Columbia. July. n. 189.

1. *Poa pratensis*, L.—Hook. Fl. Bor. Am. vol. ii. p. 246.

HAB. Cœur d'Aleine. n. 359.

2. *Poa serotina*, Ehrh. *P. crocata*, Mx.—Hook. Fl. Bor. Am. v. 2. p. 246.

HAB. Rocky banks of rivulets, Kooskooskie. June. n. 12 and 359.

3. *Poa Michauxii*, Kth. *Brizopyrum boreale*, Nees.—Hook. Fl. Bor. Am. v. 2. p. 254.

HAB. Saline, exsiccated, depressed situations in the valley of Lower Platte.

1. *Glyceria nervata*, Trin.—Hook. Fl. Bor. Am. vol. ii. p. 248. G. *Michauxii*, Kth. *Poa nervata*, Mx.

HAB. Swampy meadows, Kooskooskie Valleys. July. n. 497.

1. *Reboulea gracilis*, Kth.—Hook. Fl. Bor. Am. vol. ii. p. 249.

HAB. Gravelly banks of rivulets, Kooskooskie Valley. July. n. 508.

1. *Koeleria cristata*, Pers.—Hook. Fl. Bor. Am. vol. ii. p. 249.
HAB. High volcanic plains of the Spokane River, in Pine-woods, and rocky banks of rivulets, Kooskooskie Valley. June, July. *n.* 357 and 537.
1. *Festuca ovina*, L.—Hook. Fl. Bor. Am. vol. ii. p. 250.
HAB. One of the principal Grasses in the plains of Upper Missouri and Oregon. June. *n.* 356.
2. *Festuca bromoides*, L.
HAB. Stony, loamy, denuded places, Kooskooskie Valley. June. *n.* 358.
3. *Festuca tenella*, Willd.—Pursh, Am. vol. i. p. 83.
HAB. Barren, stony, loamy places, Kooskooskie Valley. June. *n.* 360.
1. *Bromus Oregonus*, Nutt.
HAB. Sandy moist meadows, Upper Missouri and Oregon territories. June, July. *n.* 244.
1. *Triticum repens*, L.—Hook. Fl. Bor. Am. vol. ii. p. 254, var.
HAB. Plains of Upper Missouri. July. *n.* 192.
1. *Elymus arenarius*, L.—Hook. Fl. Bor. Am. vol. ii. p. 255.
HAB. Grassy borders of rivulets, Spokane Plains. July. *n.* 541.
2. *Elymus Canadensis*, Mühl.—Hook. Fl. Bor. Am. vol. ii. p. 225.
HAB. Grassy rivulets, valley of Spokane River. July. *n.* 570.
1. *Polyantherix Hystrix*, Nees. *Asprella, Humb.*—Hook. Fl. Bor. Am. vol. ii. p. 256.
HAB. Saline, inundated, sunny meadows along the Lower Platte. July. *n.* 121.—Arid, sandy Pine-woods, Tchimakaine, Spokane country. July. *n.* 503.
1. *Hordeum jubatum*, L.—Hook. Fl. Bor. Am. vol. ii. p. 256.
HAB. Saline meadows, Lower Platte. July. With *n.* 121.
2. *Hordeum pratense*, Huds. *H. secalinum, Schreb.*—Hook. Fl. Bor. Am. vol. ii. p. 256.
HAB. Stony, exsiccated watercourses, Spokane Plains. July. *n.* 554.
1. *Calanthera dactyloides*, Kth.—Nutt. *Sesleria, Nutt. Gen. v. 1. p. 65.*
HAB. Fertile plains of the Lower Platte. The "Buffalo-grass" of the trappers, as it occurs only within the range of the Bison. Anthers bright orange. June. *n.* 18.
1. *Beckmannia erucaeformis*, Host.—Nutt. Gen. t. 1. p. 48.
HAB. Stony saline swamps of Upper Missouri and Oregon. June. *n.* 240.

1. *Lepturus paniculatus*, Nutt. Gen. 1. p. 81.—Kunth, Agrostr. p. 463.

HAB. Sparingly in saline, exsiccated, loamy places. July. n. 152.

1. *Melica bulbosa*, Geyer, MSS.

HAB. Rocky ravine, Upper Platte, and only seen in one grassy spot. June. n. 11.

DR. MEISNER on CHAMÆLAUCIÆÆ.

At a meeting of the Linnæan Society, held on the 20th ult., the Secretary read a paper, by Dr. Meisner, of Basle, on the new *Chamælauciææ* contained in the last collection of Drummond's Swan River Plants—that formed during an excursion of eighteen months to the northward of the settlement. The paper includes descriptions of twenty-two new species, viz.:—*Genetyllis*, 4; *Verticordia*, 7; *Chamælaucium*, 2; *Pileanthus*, 1; and *Calycotrix*, 8. In describing the new species of *Verticordia*, the author calls attention to some details of structure, which appear to have been hitherto overlooked or misunderstood, and which, in his opinion, render necessary certain changes in the character and subdivision of that genus, for which he proposes four sections, characterized by differences in the number and distribution of the calycine segments, viz.:—1. *Euverticordia* (including the section *Chrysoma* of Schauer); 2. *Verticordella*; 3. *Catocalypta*; and 4. *Pennuligera*.

The following is a list of the species described by Dr. Meisner, with Mr. Drummond's corresponding numbers:—

1. *Genetyllis* (Involucrætæ) *speciosa*, *Meisn.* = Drummond, coll. VI., No. 34!

2. *G.* (Involucrætæ) *helichrysoides*, *Meisn.* = Drum., coll. VI., No. 35!

3. *G.* (Bracteætæ) *sanguinea*, *Meisn.* = Drum., coll. VI., No. 36!

4. *G.* (Bracteætæ) *virescens*, *Meisn.* = Drum., coll. VI., No. 37!

5. *Verticordia* *stelluligera*, *Meisn.* = Drum., coll. VI., No. 38!

6. *Verticordia* *nobilis*, *Meisn.* = Drum., coll. VI., No. 47!

7. *Verticordia* (Catocalypta) *callitricha*, *Meisn.* = Drum., coll. VI., No. 48!

8. *Verticordia* (Catocalypta) *ovalifolia*, *Meisn.* = Drum., coll. VI., No. 45!

9. *Verticordia* (Pennuligera) *chrysostachys*, *Meisn.* = Drum., coll. VI., No. 46!

10. *Verticordia (Pennuligera) oculata*, *Meisn.* = *Drum.*, coll. VI., No. 43!
11. *Verticordia (Pennuligera) grandis*, *Drum.*, in *Hook. Journ.*, 1853, p. 119 = *Drum.*, coll. VI., No. 44!
12. *Chamælaucium Drummondii*, *Meisn.* = *Drum.*, coll. VI., No. 41!
13. *Chamælaucium affine*, *Meisn.* = *Drum.*, coll. VI., No. 40!
14. *Pileanthus filifolius*, *Meisn.* = *Drum.*, coll. VI., No. 42!
15. *Calycothrix tenuifolia*, *Meisn.* = *Drum.*, coll. VI., No. 57!
16. *Calycothrix rosea*, *Meisn.* = *Drum.*, coll. VI., No. 56!
17. *Calycothrix lasiantha*, *Meisn.* = *Drum.*, coll. VI., No. 53!
18. *Calycothrix brevifolia*, *Meisn.* = *Drum.*, coll. VI., No. 58!
- * 19. *Calycothrix Drummondii*, *Meisn.* = *Drum.*, coll. VI., No. 52!
20. *Calycothrix tenella*, *Meisn.* = *Drum.*, coll. VI., No. 55!
21. *Calycothrix tetragonophylla*, *Meisn.* = *Drum.*, coll. VI., No. 54!
22. *Calycothrix puberula*, *Meisn.* = *Drum.*, coll. VI., No. 51!

Uses of Scirpus lacustris (Bullrush) in South America.

We are familiar with many of the uses of the common Bullrush in our own country, for thatching, for making panniers, beehives, horse-collars, chair-bottoms, etc. etc. It serves for more numerous and more important purposes in Peru and Bolivia. In the very interesting Introduction to the 'Additions à la Flore d'Amérique du Sud, par M. Weddell' (Paris, 1850), the author says, p. 56, speaking of the vicinity of the famous Lake Titicaca, "Plusieurs cours d'eau affluents du lac coupent aussi ce district: je les passai dans des singulières embarcations composées de deux grosses bottes ou cylindres de joncs liés ensemble, et relevés en pointe aux extrémités. Ce jonc est une espèce de *Scirpus*, très-voisine de notre *S. lacustris*,* et se trouve abondamment dans presque tous les bas-fonds du lac; c'était la plus grande plante que je voyais depuis mon départ de la Paz." And again, in his second visit to that region, 'Voyage dans le Nord de la Bolivie' (Paris, 1853), in describing the passage "du singulier canal qui porte le nom de Desaguadero, et qui fait communiquer le grand lac de Titicaca avec celui

* No doubt the *S. Tatora*, Nees et Mey. in *Linnæa*, ix. p. 292. But there is good reason to believe it identical with *S. lacustris*, which we have from Peru; and indeed from Iceland in the north, and New Zealand and Van Diemen's Land in the south, and from Peru and other parts of South America.

d'Aullagas,"—he writes, "Le point où nous le traversâmes s'appelle Balsas de Nasahara, à cause du pont de bateaux (*balsas*) qui en rallie les rives. Ces *balsas* sont construits avec une espèce de jonc (*Totora*) très-abondant dans quelques marais et dans les lagunes de la Cordillère, et ressemblant, à s'y méprendre, à notre *Scirpus lacustris*. Un plancher très-épais, également en *Totora*, repose sur les balsas, et le tout est maintenu aux rives par des câbles de la même matière."

Lieutenant Gibbon, in his 'Exploration of the Valley of the Amazon' (Washington, U.S., 1854), speaking of the Lake Titicaca, describes their boats:—"The Indians navigate the lake in *balsas*, or boats, made of the lake-rush, which forms the material for both hull and sails: they can only sail with a fair wind."—"The surface of the lake in front of Puna is nearly covered with dead rush-stalks: the stench arising is disagreeable." It seems to grow everywhere along the shores. "Here and there this lake is shoal to the nearest island, about a mile off. The rush grows thick on these shoals, which gives them a meadow-like appearance." But the summary of the history of this plant is given at p. 102:—"All the dead rushes, driven by the east winds to the west side, lodge on the flats and beach, manure the dry places, and deposit their seed; more rushes grow there to catch the sediment as the water filters through. Year after year the growth dies off, breaks down, and helps the upward levelling law. The rush grows from six to eight feet long, and is called *Totora* by the Indians. The stalk is in size and shape like the blade of a bayonet" (the author is a Lieutenant, and no botanist), "with a head and flower resembling clusters of ripe buckwheat. It supplies the place of wood, iron, canvas, and greens. The Indians were taught by the Incas to make bridges of it, over which they passed their armies: their boats and sails, houses and beds are sometimes made of it. An old Indian was seen refreshing himself with the juice at one end of the stalk, while his little child tickled another one's nose with the flower. Such are the value and uses of this wild vegetable production."

Lieutenant Gibbon, who has evidently a great dislike to these elevated regions, and a taste for the good things of the lower, and thinks the former should be left to the wild Indians, concludes his observations with the following quaint remarks:—"We cannot understand why the population of those mountains have not cleared more lands at the base of the Andes, where their children would find beautiful flowers,

and the men their real sugar-stalk; where they might tickle their noses with the fragrance from rich pine-apples and oranges, and where their tables might be loaded with the choicest vegetable productions."

BOTANICAL INFORMATION.

Extracts of recent Letters from DR. HARVEY, dated Sydney, May and June, 1855.

"I arrived here on the 1st instant, and have been botanizing in the neighbourhood. It is wretched ground for *Algæ*; and a trip to Newcastle (Hunter's River), from which I have just returned, has little result, except that I collected *Martensia elegans* in plenty.

"I have now engaged a passage in a missionary vessel, for a cruise among the Tonga and the Feejee Islands. We are to visit every island of these groups, I am told, staying a few days at each, and to be absent about four months, when we return to Sydney: this ought to be about October next. About that time Sir William Denison will be making a coasting tour to all the colonial ports north of Sydney, and has offered to take me with him, should I have then returned from the Feejees. I am anxious to see those islands, for the sake of visiting the coral banks, and finding more *Vanvoorstias*. I remain with the vessel, which is a most comfortable one, fitted up like a yacht, where I have a cabin to myself, and there is a large saloon. She belongs to the Wesleyan missionaries, to whom Henry Christy gave me a letter of introduction from their secretary in London. I had first asked a passage in the 'Herald,' but she will be absent nine or ten months on her next cruise, a great part of which will be deep-sea soundings, to prove the non-existence of reefs laid down in the charts; so Captain Denham discouraged my going.

"I have still nearly a fortnight before the vessel starts, which I shall occupy in short excursions round Sydney. As yet very few flowering plants are in blossom, but there are some. Luminous fungi were very common when I arrived (in heavy rains), but have disappeared. I collected a single specimen of *Aseroe*, and have dried it tolerably."

"June 13, 1855.

"I have just time to send you a few lines, to keep you *au courant* of

my progress. I expect to sail tomorrow morning, on board the 'John Wesley,' missionary brig, on a cruise to some of the Pacific islands. We shall first of all call at Auckland, New Zealand, where we remain a week or ten days; then proceed to Tongataboo, and visit each of the Friendly Islands in turn; then we proceed to the Feejee group, and shall visit several of those islands, as there are thirteen mission stations in that cluster; we then (probably) visit the Navigators, and perhaps the outlying island of Rotuma, and so return to Tongataboo, from which we return to Sydney, the whole route occupying about four, or perhaps, five months from this time; you may therefore address your next letter to Sydney, care of Mr. Moore, Botanic Gardens. On my arrival from the Islands I shall write to you, touching my success or failure, and to tell you of my future plans, which will depend on circumstances.

"I arrived in Sydney on the first of May, and have only visited Newcastle as yet, besides short trips in the vicinity of Port Jackson. The coast is not prolific, I believe. I wrote you of my Newcastle trip a few days ago. Since my return, while dredging in the Paramatta River, I found a single specimen of a new species of *Claudea*! quite distinct from *C. elegans*, from which it differs in the form of the leaf, and specially in the pattern of the network; the ribs and nerves diverge in a radiant manner, instead of being parallel and at right angles, and the smaller bars of the network cross in a decussate manner. I went the following day and dredged for six hours over the same ground, but found no more; I shall have another trial on my return: it would be too provoking to leave Sydney finally without securing more specimens of this singular plant. The pattern of the net is more like that of *Vanvoorstia* than of the old *Claudea*, but it has all the essential characters of the latter genus."—W. H. H.

Vegetable Fibres.—Botanical Garden, Peradenia, Ceylon.

"The Committee bear willing testimony to the desire evinced by the present Superintendent of the Botanical Garden, Mr. Thwaites, to render his researches practically useful to the Colony, particularly in connection with the inquiries which have recently been made for fibrous substances. The specimens however that have been produced, though

interesting in themselves, are too small in bulk to render it possible that their value as articles of trade can be accurately determined. The Committee therefore think, that a portion of the time and talents of the Superintendent of the Botanical Garden might be employed with advantage to the Colony in organizing arrangements for the preparation, on account of Government, of a ton or two of each of those fibres that may be procured from plants commonly met with either in the jungles or upon lands belonging to the natives of the country, in order that such specimens may be forwarded to London, to be reported upon and sold, and their value be thus satisfactorily ascertained.

“As soon as this information has been procured, the Committee suggest that a popular account should be published, in the English and native languages, of the plants producing the fibre, the most economical and the best mode of preparing them, the cost, or the number of days’ labour required to produce a hundredweight of each description, together with any other similar details and particulars that would be important or useful.

“The Committee recommend this course, because, in order to render any discovery largely beneficial to the colony, it is indispensable that it be suited to the habits of the mass of the people, and of a nature likely to be adopted by them; and although very little success has yet attended the efforts that have been made to tempt the people of the country to new fields of enterprise, the Committee think there has been just enough to show that it is not actually impossible to accomplish this desirable object. As an instance of success, they mention the readiness with which the natives have brought in for sale great quantities of coir, prepared so as to be used instead of bristles in the manufacture of certain kinds of brushes; and it is well known that the demand for coir, prepared precisely in this manner, dates only from the commencement of the war in which Great Britain is now engaged with Russia. Another reason why discoveries, to be useful, should be applicable to the mass of the population, exists in the fact that in villages, remote from the principal towns, the value of labour must be extremely small; this is evidenced by the price at which some articles, which are manufactured in such localities, are brought forward for sale in the markets of the different leading towns.”

Note on ASPLENIUM FONTANUM, by Mr. THOS. MOORE.

I add a remark to your account of *Asplenium fontanum* as a British plant (p. 340). The Tooting habitat, for which you quote the 'Phytologist' for 1852, is thus mentioned in my 'Handbook' (ed. 1848):—"Found in 1845, growing in company with *Asplenium Trichomanes* on an old wall near the mansion of the late D. Haigh, Esq., Tooting Common, Surrey, where it had certainly not been lately introduced." It was found by the gardener there, Mr. Gibbs, a most intelligent and respectable man of advanced years, who had for a long while, something like half a lifetime, held the situation. He had not been previously a Fern-grower, and was certain that the plant had not been artificially introduced within a period of almost half a century. This carries us back to a date when Ferns were so little grown, or cared for as cultivated plants, that I am at a loss to conceive how the *Asplenium* was to have reached such a position either accidentally or by design. At the Hampshire habitat the plants, I am told, form large patches, the size of which, as this species is not a rapidly extending plant, would give them an age to which the above consideration would apply with scarcely less force. I may also incidentally mention, as it affects another of our disputed species, that the same consideration applies to the Leyton habitat of *Cystopteris alpina*, which plant is sometimes excluded from our Flora as unceremoniously as the *Asplenium*. Mr. W. Pamplin tells me he well remembers that when quite a boy, which must carry the observation back nearly or quite to the beginning of the present century, he was in company with his father, who drove up to the roadside wall on which "the rare Fern" grew, and at that time the appearance of the plant, now fresh in his memory, was as if parsley had been sown along the wall. This *Cystopteris* does not spread rapidly, and such an appearance, even if exaggerated by childish inexperience, could only have resulted from its having been very long established there. This would carry back the date so nearly a century, that one naturally inquires who then cared for, or cultivated, or could have artificially introduced such a Fern. Nowadays, when there is such a *furor* for Ferns, a European species might become naturalized through the proximity of cultivated specimens, but it was hardly likely to happen in the middle of the last century. Recurring to the *Asplenium*, the following memoranda are quoted from my 'Handbook' (first edition,

1848):—"Mr. T. Cox informs me that he has recently, without success, examined Amersham church, in Bucks. There are specimens in the Herbarium of the Botanical Society of London, marked from Cavehill, Belfast, on the authority of Mr. W. O. Newnham; and others from rocks in Wharfedale Wood, Yorkshire, said to have been collected in 1838, by Mr. R. M. Redhead. Mr. Hutcheson, gardener at Boxley Abbey, informs me he gathered it in 1842 on rocks near Stonehaven, in Kincardineshire. Many localities where it may exist have certainly never been examined by a scrutinizing eye." The exact habitat near Stonehaven, Mr. Hutcheson has subsequently informed me, has been destroyed by the formation of the railway.

DR. ASA GRAY *on the Development of the Seed-coats of Magnoliaceæ*.*

"I have now completed the investigation of the seeds of *Magnolia umbrellæ*, and have got a good set of sketches made by Sprague, whose sharp eyes fully confirm all I stated. I can now further say, that the *crustaceous* covering of the seed is represented in the ovule only by the innermost layer of cells of the external coat or *primine*; that when the seed is about half-grown, the cells of this innermost layer begin to increase by merismatic division, and elongate horizontally, so producing the crustaceous coat. Now (July 31) when the seeds of *M. umbrellæ* have attained their full size, this coat is already hard; its very small cells are thickened and indurated by a very irregular and reticulated deposition on the walls, which, at the first appearance of these cells, were very thin, and destitute of markings."

AGAVE AMERICANA in Devonshire.

The first American Aloe (*Agave Americana*) that ever grew and blossomed in the open air, in Britain, was in the garden of the late James Yates, at Salcombe, Devonshire, about the year 1814. We thought it a privilege to see the plant after it had done flowering, with the withered scape, attesting the fact, still attached to it. That plant was stated to have been only twelve years old. Its locality was upon the lawn in

* See vol. vii. p. 243, of this Journal.

front of Mr. Yates's villa, and, as far as we can remember, with only the road intervening between it and the sea-beach.

Since that period Salcombe has increased in population, in houses and villas, and no doubt in Agaves: for our valued friend John Luscombe, Esq., of Combe Royal, in the same neighbourhood, himself a great lover of plants, has sent us photographed portraits of no less than four different Agaves at this time (November, 1855) in full flower, in three different localities, at Salcombe. All are photographed by Mr. R. P. Yeo.

One is on the property of Mrs. Prideaux, Cliff House; and is represented within a wall on a small promontory, apparently jutting into the sea. It is twenty-six years old, and had attained a height of twenty-six feet. (Photographed November 1, 1855.)

A *second* and *third* are represented upon the side of a rough hill, full of wild plants, and seemingly not in any garden or enclosure: these are respectively twenty-six years old and twenty-five feet high; and thirty years old, twenty-eight feet high. Other flowerless Agaves growing close by, and the broad sea visible over the edge of the hill, give the scene the appearance of a coast of the Mediterranean about Nice. These are on the property of Mr. Strong. (Photographed November 2, 1855.)

The *fourth* is in the grounds at "the Molt," the property of Lord Courtenay: the height not given;—but judging from the size of the tasteful residence adjacent, and the neighbouring trees, altogether forming a most charming subtropical landscape, it must be the tallest of the four. (Photographed October 27, 1855.)

Our greenhouse Agaves, as is well known, flower so rarely as to have given rise to the saying—and which everybody believes—that the American Aloe is a plant which blossoms only once in a hundred years: here again we suspect horticulture is at fault.

Flora Indiæ Batavæ.

We are glad to see announced a 'Flora Indiæ Batavæ, oder Flora von Niederländisch-Indien, von F. A. W. Miquel,' vol. iii., royal 8vo, with 50 plates and a map. Subscription price, 24 dollars.

NOTICES OF BOOKS.

MOORE, THOMAS, F.L.S.: *The FERNS of Great Britain and Ireland.*
Edited by JOHN LINDLEY, Ph.D., F.R.S., etc. Imp. folio. Parts
 VIII. and IX. Nature-printed by Henry Bradbury. London. 1855.

Our frequent notice of the progress of this work is a proof of the esteem in which we hold it. The interest of the subjects here under discussion (for few departments of Botany are more in general favour than the Ferns), the peculiar art by which the plates are represented, and the devoted zeal with which Mr. Moore performs his share of the publication, cannot fail to place it in the first of the kind of the present day; and we should be sorry, if we have in any way misinterpreted a passage in the descriptive pages of the last fasciculus (VII.), not to take an early opportunity of correcting it, and this we shall do in Mr. Moore's own words. It is in reference to our observations at p. 350 of the last (seventh) volume of our Journal: "In your last notice of the Nature-printed Ferns, you have somewhat misapprehended a statement I have made in describing *Lastrea spinulosa*. By a reference to the passage preceding that which you have quoted (p. 351), it will be seen that it was *L. cristata*, *uliginosa*, and *spinulosa*, to which I referred as so closely merging into each other by means of transition-forms of frond, that I had come to the conclusion that 'all three' were mere variations from one specific type. You appear to have understood that *L. cristata*, *spinulosa*, and *dilatata* were meant, and very naturally express surprise that, while holding this view, I should separate the two former from the latter. This however was not my conclusion. I look upon *L. dilatata*—itself a very variable and extensive group of forms—as distinct from the former three, although, as you well know, the subject is not free from difficulty, nor perhaps from doubt. The chief of these doubts and difficulties however appear to me to arise from the fact that the specimens of these Ferns in herbaria from foreign countries are generally detached fronds, or too often mere mutilated fragments of fronds; and I have little doubt that, if in the case of these foreign examples one could see the entire plants, there would be no great difficulty in referring them to one or the other of the two groups I have indicated, as there is no great difficulty in referring those British examples of which complete specimens are examined. I may

take the opportunity to mention that the fronds of *uliginosa*, figured on Plate XX., to which you specially allude (p. 320), were from one root, the production of such fronds being the characteristic of this variety. They are themselves the evidence which led me to the conviction that there is a close affinity between *L. cristata* and *L. spinulosa*. In including this latter name as that of a variety under *L. cristata* (Plate XIX.), I expressed my own view of the subject, as originally stated in my 'Handbook of British Ferns,' whilst it was printed somewhat more prominently at Plate XXI., in deference to the more general opinion. The main differences of the two groups I have above alluded to are pointed out in the text which accompanies Plate XIX."

On the above explanation, we will take leave to say that, with the inestimable advantages Mr. Moore possesses in 'Nature's Printing,' we think he would do best to be totally uninfluenced by the views and opinions of others; and that, by confining his main attention to the beautiful types of the species so faithfully represented on the plates, and discarding the hosts of synonyms (many of which cannot possibly, *with certainty*, be determined)—we especially allude to the *dilatata* and *spinulosa* group—and the overwhelming enumeration of varieties, he will come to a more accurate determination on these *questiones vexatæ*. We learn, for example, from Mr. Moore that the two left-hand figures (Tab. XX., *Lastrea cristata uliginosa*) are derived from the same root as the right-hand figure. This being the case, whatever may have been said in favour of the two former being considered to belong to *L. cristata*, it is quite certain that they are one and the same with the right-hand figure; and further, the outline does not partake of that of the true *cristata* (it is not narrowed at the base); and if we look at the "*L. spinulosa*" figured at Tab. XXI., we think there can hardly be a doubt of the propriety of referring it to that species, and that *L. spinulosa* is exactly intermediate between the two Ferns figured at Tab. XX., which two are from one and the same root. Surely if two forms are so different that one has been generally referred to *L. cristata* and the other to *L. spinulosa*, it should teach us a lesson not to raise less marked variations to the rank of species.

If, now, the *L. cristata uliginosa* may be safely referred to the *spinulosa* as represented at Tab. XXI., we think he must be a bold man who will separate Mr. Moore's *L. dilatata Chanterixæ*, Tab. XXIV., specifically, from *L. spinulosa*. If this be granted,—and entirely agree-

ing with him in the identity of the other marked varieties of *dilatata* figured; viz. Tab. XXII., the Hampstead Heath plant which we presume is the typical form in Mr. Moore's view, "*normalis*," *L. dilatata glandulosa*, Tab. XXIII., and *L. dilatata dumetorum*, Tab. XXV., together with *L. dilatata collina* and *L. dilatata nana*, Tab. XXVI.,—we cannot but regret to see nine and a half imperial folio pages devoted to the discussion of this single species, and these six varieties, now alluded to, multiplied into nine lesser varieties bearing names (exclusive of the typical form "*normalis*"). The history concludes with the remark, "Besides the varieties already mentioned, which we consider the most distinct and important, there are many other—indeed almost endless—modifications of this Fern, many of which, however, we believe to be permanent forms, although they have not all been proved by cultivation;" and with "a summary of the various forms which have come under our observation"—eighteen in number.

With such materials before him, and such means of laying, as it were, the *specimens themselves* before his readers, Mr. Moore has a right to exercise his own sound judgment, irrespective of the opinions of others, in assigning the limits of species. Then, we should say, the more concise the characters and descriptions, the better for the very numerous class who take delight in the study of Ferns, but who are puzzled at the very threshold by the wild speculations of species-makers.

We next come, Tab. XXVII., to another Fern, on which our own views are at variance with those who raise it to the rank of a species, viz. *L. fœnisecii* (Nephrodium, Lowe). Whatever the differences may be, however, and they are well known to British botanists (the plant is said to be hitherto found nowhere but in the British Islands and those of Madeira, Azores, and Cape de Verd), *Nature's printing* assuredly fails to represent them. There is no visible difference between the figures of *L. fœnisecii*, Tab. XXVII., and *L. dilatata (normalis)*, Tab. XXII., or *L. dilatata collina*, Tab. XXV. It is true the diagnoses given are such as cannot be represented by this curious art. "The fragrance is a remarkable characteristic." "The scales of the stipes are fewer, narrower than in *L. dilatata*, and fringed or lacerate at the margin, pale brown and concolorous." "The fronds are more decidedly evergreen, and *commence to decay from the point, not from the base of the stipes.*" Can there be such a difference? "The indusium

is not bordered with stalked glands." "The concave, crispy surface of the fronds will suffice to distinguish the plant, without recourse to the more minute characters residing in the scales and indusia."

Tab. XXVIII. is *Lastrea Oreopteris*, a species which speaks for itself, and whose specific identity has never been called in question. But it is one of those works of Nature which mocks at our generic distinctions. The indusium, small at any time, is frequently wholly wanting, or at any rate invisible, and thus has as good a claim to be ranked with *Polypodium* as with *Lastrea*, and M. Fée still ranks it in his group *Gymnosoria*.

HOOKEE, DR. JOSEPH DALTON: *The BOTANY of the ANTARCTIC VOYAGE*.—III. *FLORA of TASMANIA*. Part I. 4to. Twenty Plates. London: Lovell Reeve.

Of the 'Botany of the Antarctic Voyage' two great and important portions are completed, viz. :—

1. The *Flora Antarctica*, comprising the botany of *Lord Auckland's Group* and *Campbell's Island*, the vegetation of which is so peculiar as to merit a separate consideration; and *Fuegia*, *South Patagonia*, the *Falkland Islands*, *Palmer's Land*, and the adjoining groups, as the *South Shetlands*, *South Georgia*, and, proceeding eastward, *Tristan d'Acunha* and *Kerguelen's Land*. Their flora is included in two large quarto volumes, illustrated by 198 coloured plates, many of them representing two or more species.

2. The *Flora Novæ-Zelandiæ*, embracing the several islands of that group; also in two volumes large folio, with 130 coloured plates.

The indefatigable author has now commenced the third and last portion of this undertaking, the *Flora of Tasmania*. The general plan, the descriptive portion and the plates (drawn and lithographed by Mr. Fitch) correspond with what has already appeared, and the same pains are taken in every part of the execution. The present number (arranged according to De Candolle's 'Prodrômus') extends to the commencement of *Leguminosæ*. Very valuable observations are introduced on the geographical distribution of the species, and much more will be said on that subject when the Author publishes the "Introductory Essay to the Classification of Australian plants," which will be appended to this work. The important collections of Dr. Mueller in the Aus-

tralian Alps (as they are usually called), the highest ground in South Australia, and which have been so liberally communicated to us, are eminently illustrative of the vegetation of Tasmania. Twenty plates, beautifully coloured, accompany this fasciculus. The second fasciculus is in a considerable state of forwardness.

REICHENBACH, HEINRICH GUSTAV, *fil.*: XENIA ORCHIDACEA. Beiträge zur Kenntniss der Orchideen. 4to. 4 Fasciculi, with 40 plates, plain or partially coloured. 96 pp. Leipzig, 1854-5.

This is a truly scientific work, and a valuable contribution to our knowledge of Orchidaceous plants, which, together with the Ferns, seem, just now, to be the most attractive of all plants to the horticultural world. Here however the subjects are not, as in so many treatises on this family, selected for their beauty, but for the sake of illustrating the genera and species. Many, perhaps most of them, are necessarily taken from dried specimens, and the drawings and analyses are executed by Reichenbach, *fil.*, himself. These are of great value to all botanists, and we cannot but thank Dr. Reichenbach, *fil.*, for representing whatever of rarity or novelty comes in his way, irrespective of size or brilliancy of colour. Genera, and species too, are not wanting among them. We may especially mention *Epistephium Frederici-Augusti*, Reich. *fil.*, Tab. A; *Masdevallia elephanticeps*, Reich. *fil.*, Tab. B; *Vanda cærulea*, Griff., Tab. 5; *Pescatorea triumphans*, Reich. *fil.*, Tab. 11; *Vanda suavis*, Lindl., Tab. 12; *Cattleya Wageneri*, Reich. *fil.*, Tab. 13; *Uropodium Lindenii*, Lindl., Tab. 15; *Miltonia anceps*, Lindl., Tab. 21; *Odontoglossum Schillerianum*, Reich. *fil.*, Tab. 22; *Warszewiczella velata*, Reich. *fil.*, Tab. 23; *Solonipodium Hartwegii*, Reich. *fil.*, Tab. 27; *Cattleya Warszewiczii*, Reich. *fil.*, Tab. 31; *Brassia Gireoudiana*, Reich. *fil.*, Tab. 32; *Oncidium Kramerianum*, Reich. *fil.*, Tab. 33 (too near *O. Papilio*). These are all eminently worthy of a place in any Orchideous house, and some are all already in cultivation. The generic and specific characters and descriptions are in Latin, the observations in German. We trust nothing will hinder the continuance of this valuable work. We were sorry to find a hiatus of eleven months between the third fasciculus (Nov., 1854), and the fourth fasciculus (Sept., 1855), and no more has at present reached our hands.



Definitions of Rare or hitherto Undescribed AUSTRALIAN PLANTS, chiefly collected within the boundaries of the Colony of Victoria; by Dr. FERDINAND MUELLER, Government Botanist for the Colony of Victoria.

(Continued from p. 11.)

IX. SAPINDACEÆ.

29. *Dodonæa procumbens*, F. Muell.; branches prostrate; twigs hardly angulated; leaves somewhat scabrous, flat, cuneate, grossly three-toothed at the top; pedicels from the summit of the twigs solitary, or rarely two or three together, shorter than the leaves, as well as the calyx hirtellous; flowers diœcious, pentamerous, with a long style; capsule with three broad, rounded wings.

HAB. In subsaline flats and peaty places at the foot of Mount Sturgeon and Mount Abrupt.

30. *Dodonæa deflexa*, F. Muell.; upright, somewhat scabrous, viscose; twigs angulated, patent; leaves coriaceous, nearly round or ovate, repand and undulate at the margins, and sometimes remotely toothed, truncate or rounded at the top; flowers diœcious, axillary, solitary or geminate; pedicels deflexed, shorter than the leaves; sepals ovate, nearly round; capsule truncate, with four or five wings, which are expanded upwards.

HAB. In the desert scrub along the Murray River and Spencer's Gulf.

31. *Dodonæa bursariaefolia*, F. Muell.; smooth, not viscous; twigs indistinctly angulated; leaves coriaceous, nearly opaque, flat, obovate-cuneate, blunt, rarely apiculate or emarginate, always entire; flowers diœcious, axillary and terminal, solitary or two and three together; sepals oblong-linear; anthers whitish; capsule three or four-sided, with extremely narrow wings; seeds shining black.

HAB. In the barren scrub-country on the Murray River and St. Vincent's Gulf.

This species agrees in many points with *D. trigona* and *D. aptera*.

32. *Dodonæa hexandra*, F. Muell.; erect, glandular-scabrous; branchlets thin, indistinctly angulate; leaves sessile, filiform-linear, acutish, not furrowed, on the margins revolute; flowers diœcious, hexandrous, axillary and terminal, all solitary on short pedicels, nearly drooping;

sepals three, ovate-lanceolate, acuminate; filaments very short, connective puberulous at the top; capsules depressed, with three, rarely four, valves, which are wingless, but bear an appendage on the back; seed shining.

HAB. In the scrub near Port Lincoln, on limestone, *C. Wilhelmi*.

Undoubtedly similar to *D. pinifolia*.

X. AMPELIDÆ.

33. *Cissus Australasica*, F. Muell.; leaves palmate, quinquefoliate; leaflets coriaceous, stalked, smooth, ovate-lanceolate, acuminate, remotely serrate or entire towards the top, glaucous below; the paniculate cymes or the tendrils shorter than the opposite leaf, or equally long; flowers four-parted.

HAB. On the wooded banks of the Broadribb River.

This Australian species, which forms a high climber, is nearly related to *C. diversifolia*, DC. (not of Walpers).

XI. ZYGOPHYLLÆ.

34. *Tribulus acanthococcus*, F. Muell.; prostrate; leaves longer than the pedicels, with generally five or six pair of leaflets, which are oblique, ovate-lanceolate, approximate, and in size almost equal to each other, subsessile, beneath adpressed, hairy; flowers decandrous; petals obovate, exceeding in length the narrow, oblong sepals; anthers ovate; rays of the stigma reflexed, half as long as the thick style; fruit depressed, consisting of five puberulous three-seeded carpels, which are bispinose in the middle, and on the back crested and hairy, at the commissure lacunose, and destitute of a wing.

HAB. On the sandy, loamy, arid plains along the Murray and Murrumbidgee, towards their junction.

Only one Australian species has been previously described from this genus, *T. Hystrix*, R. Br. in Sturt's Exp. into Central Australia, ii. app. p. 69 (*T. lanatus*, Walp. Annal. ii. 243), for the discovery of which we are indebted to the enterprising Captain Sturt.

XII. DIOSMEÆ.

New genus: *ASTEROLASIA*, F. Muell.—*Flowers* hermaphrodite, solitary, sessile. *Sepals* five, petaloid. *Petals* five, membranous, minute, or wanting. *Stamens* ten, hardly exceeding the length of the

calyx. *Filaments* alternately shorter. *Anthers* erect, inappendiculate, fixed at the base, bilocular, cells bursting longitudinally. *Style* simple. *Stigma* deeply five-cleft, with filiform or clavate lobes. *Germens* five, concrete, with gemmulæ affixed to the central angle. *Carpels* five, tomentose, one-seeded. *Seeds* strophiolate.

Australian shrubs, resembling species of *Phebalium*, covered with stellate hairs, in allusion to which the generic name has been formed.

This splendid genus is exactly intermediate between *Chorilana* and *Geleznovia*. It differs from the former in its inflorescence, smooth filaments, basifixed anthers, and smallness or absence of petals. Through the last character it approaches to *Geleznovia*, but the stigma of the latter is undivided, orbicular; and this character is supported by its very different habit.

Three species have been hitherto discovered.

35. *Asterolasia phebalioides*, F. Muell.; branched; leaves sessile, oblong or obcordate-cuneate, retuse, on both sides tomentose, with flat margins; sepals golden-yellow, exceeding twice or three times the length of the carpidia; petals wanting; lobes of the stigma filiform, only a little shorter than the hairy style; seeds opaque.

HAB. On the stony declivities of the Grampians, the Serra and Victoria Ranges, particularly frequent on Mount Sturgeon and Mount Abrupt.

36. *Asterolasia trymaloides*, F. Muell.; much branched; leaves coriaceous, ovate, on short petioles, above glabrescent, beneath tomentose, with revolute margins; sepals of equal length with the carpidia, twice or three times longer than the petals; lobes of the stigma clavate, much shorter than the smooth style; seeds shining.

HAB. On the rocky summits of the Cobboras Mountains, in the Australian Alps, at an elevation of more than 6000 feet.

37. *Asterolasia chorilanoides*, F. Muell.; much branched; leaves very spreading, sessile, coriaceous, with revolute margins, terete-linear, smooth above and velutinous beneath; flowers small, capitate, furnished with bracteoles; sepals glabrous, of equal length with the carpels; petals wanting; filaments villous below the middle; style glabrous; stigma minute, undivided; seeds opaque, tuberculate.

HAB. On dry coast-ridges near Lake Hamilton, in South Australia, *C. Wilhelmi*.

Anomalous in producing bracts and a simple stigma, yet not to be

separated from the two other species ; offering thus a close approach of this genus to *Chorilæna*.

38. *Crowea exalata*, F. Muell. ; much branched ; upright or diffuse ; twigs indistinctly angulate, wingless, puberulous ; leaves alternate or fasciculate, broad, linear, gradually narrowing towards the base, blunt, minutely apiculate, with recurved margins ; pedicels nearly equal in length to the calyx, solitary ; petals rose-red.

HAB. On the rocky tops of Mount Macfarlane, about 5000 feet above the level of the sea ; on the gravelly banks of the Mitta Mitta and Livingstone Rivers, towards Lake Omeo, and on the Boggy Creek in Gipps' Land.

Easily distinguished from *Crowea saligna* by its thicker and much smaller leaves, which are not gradually narrowed at the top, and also by its wingless twigs and smaller flowers.

39. *Phebalium ovalifolium*, F. Muell. ; leaves coriaceous, ovate, smooth and shining above, lepidote beneath, their margins recurved ; peduncles axillary, solitary, with a single flower and three or four bracts, compressed, twice or three times shorter than the leaves ; teeth of the calyx triangular-lanceolate, glabrous ; petals ovate-lanceolate, whitish, a little longer than the stamens ; anthers affixed by their back ; filaments glabrous ; stigma capitate, five-lobed ; carpels apiculate.

HAB. In the rocky or scrubby parts of the Australian Alps, at the sources of the Murray and Snowy Rivers.

That the genera *Eriostemon* and *Phebalium* are not strictly defined by clear and natural characters, has been observed previously in other instances. This handsome species, again, may be referred to either of the two genera, which I would propose to unite.

40. *Eriostemon trachyphyllus*, F. Muell. ; tall, smooth, covered with glandular warts ; leaves herbaceous, flat, entire, oblong-lanceolate, and much attenuated towards the base, terminated at the apex by a small point, sessile, green on both sides, and shining above ; pedicels axillary, solitary, shorter than the leaves ; segments of the calyx subdeltoid, glabrous ; filaments fringed ; style smooth ; stigma five-cleft ; carpels blunt ; seeds shining, black.

HAB. On the mountains at the Snowy River, near the Pinch Range, on rocks.

A fine plant, closely allied to *E. myoporoides* and *E. intermedius*.

41. *Eriostemon microphyllus*, F. Muell. ; dwarf; branches asperous; branchlets thinly covered with stellate hairs; leaves coriaceous, crowded, much spreading, ovate or cordate-orbicular, scabrous, with recurved apex, on short petioles; flowers several together, terminal, glandulose; segments of the calyx triangular-ovate, nearly smooth; filaments as long as the corolla, glabrous, gradually tapering towards the apex; appendages of the anthers exceedingly small; style glabrous.

HAB. On the low coast ranges of Spencer's and St. Vincent's Gulf, but rare.

Of unquestionable alliance with *E. rotundifolius* (All. Cunn. in Enum. Pl. Hüg. p. 15).

42. *Eriostemon Hillebrandii*, F. Muell. ; diffuse or upright; leaves oblong, ovate or heart-shaped, truncate or shortly bifid at the top, with recurved, serrate, or entire margins, smooth on both sides, or somewhat scabrous on the surface; corymbs terminal; sepals minute, deltoideo-ovate; filaments nearly as long as the petals, smooth as well as the style; anthers inappendiculate; carpels obliquely ovate, rostellate; seeds even, and somewhat shining.—*Phebalium bilbbum*, Lindl. in Mitchell's Third Exped. ii. 178.

Var. *α, brevifolius*; diffuse; leaves ovate or cordate, 2–4''' long, imperfectly toothed, or with their margins entire.

HAB. On the rocky banks of rivulets in the Victoria Ranges.

Var. *β, longifolius*; strictly upright; leaves oblong, serrate, upwards of an inch long.

HAB. On the rocky summit of Mount William, at an elevation of 5000 feet.

This highly ornamental plant forms a connecting link between *Phebalium* and *Eriostemon*. It might almost be considered as a genus distinct from both, and South Australian specimens have been under these considerations distributed with the name of *Hillebrandia Australasica*.

43. *Chorizandra angustifolia*,* F. Muell. ; leaves as well as the branches covered with stellate hair, approximate, oblong-linear, blunt, on short petioles, with revolute margins, at length glabrescent, scabrous; corymbs capitate, terminal; bracteoles linear-filiform; sepals broad-linear, half as long as the corolla, externally somewhat hairy, connate at the base; filaments smooth, surpassing in length the narrow-lanceolate petals;

* Is *Phebalium phyticoides*, Sieb.—Ed.

style smooth; stigma punctiform; germina five, distinct, narrow, puberulous.

HAB. Interior of New South Wales.

44. *Boronia algida*, F. Muell.; fruticose, much branched; branchlets spreading or divaricate, velutinous, somewhat compressed; leaves on very short petioles, with two pairs of leaflets and a terminal one; leaflets small, coriaceous, glabrous, obcordate or cuneate-ovate, with entire, hardly recurved margins; flowers solitary, twin, or rarely several together, without a common peduncle; pedicels on the base bracteolate, of nearly equal length with the ovate-lanceolate, acuminate, glabrous sepals; petals much longer than the glabrous filaments; style smooth, very short; stigma depressed-capitate.

HAB. On the highest stony declivities of the Australian Alps, Mount Hotham, Mount Latrobe, and Mount Kosciusko.

A charming bush, allied to *B. rubiginosa*.

45. *Boronia clavellifolia*, F. Muell.; fruticose, diffuse, much branched, smooth; branches tuberculate; leaflets small, ternate, short-stalked, subclavate, terete, blunt; flowers axillary and terminal, solitary, geminate or ternate, octandrous; pedicels shorter than the flower; sepals ovate-triangular, ciliate, less than half as long as the corolla; filaments smooth, glandulose.

HAB. On sandy, loamy plains in the scrub near Lake Albert, and towards the mouth of the Murray River.

46. *Boronia cærulescens*, F. Muell.; suffruticose; stems upright, branched, terete; leaves thick, sessile, oblong-linear, obtuse, channelled, beneath glandulose-tuberculate; pedicels axillary and terminal, solitary, thickened at the apex, nearly equal in length to the leaves; flowers octandrous; sepals oblong or lanceolate, scarcely half as long as the bluish petals; filaments ciliate; seeds reticulate-venose.

Var. *α*, *glabrescens*; branches, leaves, and pedicels somewhat smooth, or slightly scabrous; flowers small, sepals acute.

HAB. In barren places, from the Mallee Scrub, on the Murray River, to Spencer's Gulf.

Var. *β*, *pubescens*; branches, leaves, and pedicels short-pubescent; flowers larger, sepals oblong, obtuse.

HAB. On the rocky hills on the Grampians, and in the desert towards Guichen Bay.

47. *Boronia veronicea*, F. Muell. (*Zieria veronicea*, F. Muell. coll.);

covered with a velvet-like indument; leaves approximate, simple, ovate or subcordate, blunt, sessile, with revolute margins; flowers tetrandrous, axillary, solitary, on short pedicels, forming at the end of the branches a foliate raceme; sepals acute, lanceolate, half as long as the corolla; filaments hispidulous; carpels elliptico-oblong, compressed, pubescent.

HAB. In sandy places about Encounter Bay and in Kangaroo Island.

By this interesting species the genus *Zieria* becomes united with *Boronia*, to which I am also inclined to refer *Cyanothamnus*.

XIII. CELASTRINÆ.

48. *Celastrus Australis*, Harv. and Muell.; climbing; branches warted; leaves glabrous, lanceolate-acuminate, crenate or repand-serrated, their teeth mucronulate; panicles terminal; capsules three-valved, cells one- or two-seeded.

HAB. On the Snowy and Buchan Rivers, not only on rich ground, but also on rocks.

The first Australian species described of this genus, resembling *C. paniculatus* and *C. dependens*, from East India.

XIV. RHAMNÆ.

49. *Trymalium phlebophyllum*, F. Muell.; branches thickly clothed with velvet hairs; leaves coriaceous, oval or roundish-ovate, blunt or retuse, perfectly glabrous above, and densely net-veined, grey-silky beneath, their margins generally reflexed; stipules lanceolate, acuminate; glomerules disposed in cymes, tomentose; carpels indehiscent.

HAB. On the rocky summits of the Elders' Ranges, and other mountains near Lake Torrens.

Easily recognized by the numerous prominent, anastomosing veins of the leaves. Length of the leaves, quarter to half an inch.

50. *Trymalium bilobatum*, F. Muell.; branchlets subvelutinous; leaves herbaceous, wedge-shaped, with a dilated, bilobed summit, the margins flat or revolute, glabrous above, thin velvety beneath, their lobes truncate, denticulate, the notch apiculate; stipules lanceolate-subulate; umbels somewhat velvety, crowded at the summit of the branches; style three-cleft; carpels bursting at the base.

HAB. On dry scrubby ridges towards Guichen Bay, and on Spencer's Gulf.

A remarkable plant; in the form of the leaves not dissimilar to *T. bifidum*; in the arrangement of the flowers and fruit, however, resembling *Pomaderris elliptica*.

51. *Trymalium bifidum*, F. Muell.; branchlets velutino-tomentose; leaves nearly herbaceous, linear, cuneate, forked, with revolute, entire margins, above glabrous or scantily tomentose, beneath densely silky-tomentose, the notch not apiculate; stipules almost lanceolate; flowers in dense glomerules, together with the floral leaves pale grey, tomentose; petals entire; style short, undivided.

HAB. In the Marble Ranges, and on the coast of Spencer's Gulf, at Boston Point, *C. Wilhelmi*.

It may possibly be a variety of the following species.

52. *Trymalium halmaturinum*, F. Muell; branches tomentose; leaves herbaceous, wedge-shaped or ovate-truncate, retuse or bilobed, with flat or recurved margins, above thinly clothed with a partially starry tomentum, beneath densely tomentose, floral leaves nearly round or ovate, entire or bilobed, the upper surface as well as the flowers covered with a pale grey tomentum; stipules ovate-lanceolate; flowers in dense glomerules; petals entire; style simple.

HAB. On sandy ridges of Kangaroo Island and Encounter Bay.

53. *Trymalium spathulatum*, F. Muell.; branchlets silky; leaves nearly coriaceous, obovate-spathulate, gradually tapering towards the base, almost sessile, with slightly reflexed margin, rounded or truncate at the summit, terminated by a short, reflexed point; those of the branches perfectly glabrous and even above, yellowish-grey silky beneath; the floral leaves grey-velutinous above; stipules linear-lanceolate or subulate, glomerules disposed in a dense panicle, when fruit-bearing clammy; petals entire; style short, undivided; carpels indehiscent.

HAB. On the stony ranges near Mount Lofty, in South Australia, and in Kangaroo Island.

Trymalium obovatum (Hook. Bot. Mag. p. 277) differs from this in having distinctly petiolate leaves, which are clothed with a velvet indument beneath, and in its larger flowers.

54. *Trymalium subochreatum*, F. Muell.; branchlets velutinous; leaves nearly coriaceous, oblong-linear, almost blunt, with revolute margins, above scabrous or scantily velutinous, beneath densely velvety; stipules lanceolate-ovate, large; flowers cymose, glomerate, with

roundish bracts; calyces grey-velvety outside, tomentose at the base; petals entire; style simple, short; stigma trilobed.

HAB. In the desert scrub on the Murray River.

Allied to *T. angustifolium* (Reissek in Pl. Preiss. ii. p. 284).

XV. LEGUMINOSÆ.

55. *Oxylobium procumbens*,* F. Muell. [*Podolobium procumbens*, Ferd. Mueller, first gen. rep. p. 12]; fruticulose, procumbent; leaves opposite or rarely ternate, lanceolate or round-ovate, flat, entire, prickly pointed, soon glabrous; stipules setaceous, reflexed; umbels terminal, pedunculate, few-flowered, sometimes compound; bracteoles, affixed to the base of the calyx, long persistent; calyces scantily clothed with short grey hair; germens silky; pods stalked, many-seeded.

HAB. On wooded hills; for instance, at Mount Disappointment, in the Goulburn Ranges, on the Delatite, in the Black Forest, at Ballarat, etc.

This plant and several allied species tend to show that the distinctions drawn between the genera *Chorizema*, *Podolobium*, and *Oxylobium* are merely artificial.

56. *Oxylobium alpestre*, F. Muell.; fruticose, diffuse or erect; leaves ternate or opposite, oblong-lanceolate, entire, sharp-pointed, soon glabrous, on the margin recurved; stipules linear-setaceous, reflexed; umbels terminal, pedunculate, few-flowered, sometimes compound; bracteoles affixed to the base of the calyx, deciduous; calyx short grey-hairy; germens densely silky; pods villose, short-stalked, few-seeded.

HAB. Not unfrequent in the higher parts of the Australian Alps.

57. *Burtonia subalpina*,† F. Muell.; twigs almost silky, soon glabrescent; leaves crowded, undivided, filiform, channelled, awnless, smooth, scabrous; stipules longer than the petiole; flowers sessile, terminal, capitate; calyx and germen villose-silky; corolla purple; style below hardly broader.

HAB. On the rocky summit of Mount William, at an elevation of about 5000 feet.

Not dissimilar to *B. diosmæfolia*, from which it differs as well as from all other Western Australian species of the genus, in producing stipules. The pod is yet unknown.

58. *Phyllota pleurandroides*, F. Muell.; twigs pubescent; leaves re-

* *Oxylobium spinescens*, DC.

† This is probably a species of *Pullenaea*.—ED.

curved, spreading, linear, sharp-pointed, scabrous, with refract margin, the floral ones crowded, and below the middle villose; flowers concealed between the leaves, either axillary, solitary, or collected in terminal few-flowered heads; bracteoles ovate, keeled, shorter than the tube of the silky calyx; standard surpassing considerably the length of the keel, but little that of the wings; style below the middle appressed-hairy, unbearded on the apex; pod somewhat hairy, ovate, slightly compressed; seeds destitute of a strophiole.

HAB. In arid plains, at the foot of Mount Abrupt, in Kangaroo Island, and Encounter Bay.

59. *Eutaxia sparsifolia*, F. Muell.; branchlets spreading, silky, as well as the calyces; leaves dispersed, short-stalked, semiterete, trigonous, channelled, glabrous, acutish, slightly recurved, spreading, at length deflexed; flowers a few together on the top of the branchlets, stalked, without bracteoles; upper lip of the calyx rounded, a little emarginate, teeth of the lower lip deltoid acuminate; pods turgid.

HAB. In the desert scrub towards the mouth of the Murray River. Found also at Tumbay Bay by C. Wilhelmi.

60. *Pultenæa Benthami*, F. Muell.; robust, erect; twigs angular, somewhat silky; stipules lanceolate-subulate, concrete at the base; leaves nearly flat, coriaceous, lanceolate or oblong, awnless or ending in a sharp point, either smooth and even on both sides, or below silky; petiole very short; heads terminal, few-flowered, surrounded at the base by imbricate brown, ovate, or roundish ciliolate bracteas; bracteoles navicular-lanceolate, with exception of the margin, smooth, brown, scarious, affixed to the tube of the whitish-silky calyx; upper lip of the calyx short-bilobed, considerably shorter than the lanceolate subulate laciniae of the lower lip; germen, together with the basis of the style, silky.

HAB. On springs and rivulets in the Grampians, and amongst rocks on the top of Mount Abrupt.—This elegant species, which stands nearest to *P. myrtoides*, A. Cunn., has been named in honour of Mr. George Benthams, the eminent monographer of this Order of plants.

61. *Pultenæa fuscata*, F. Muell.; branchlets hardly spreading; leaves stalked, trigonous, linear, channelled by the inflexed margin, acute, mucronulate, the uppermost below the middle long ciliated, the rest smooth; stipules large, concrete, imbricate, setaceous, acuminate, fringed; heads few-flowered; teeth of the calyx and bracteoles setaceous, acuminate, downy; ovary sessile, silky.

HAB. Between the Coorong and Murray River, on scrubby localities. Next to *P. aristata*.

62. *Pultenæa canaliculata*, F. Muell.; branchlets hardly spreading, velvety; leaves oblong-linear, blunt, very short-stalked, channelled, gradually tapering into the base, somewhat silky; stipules lanceolate or linear-subulate, downy; heads few-flowered; calyces downy, pale, membranous, little longer than the downy, linear, setaceous bracteoles; teeth of the upper lip broader, all setaceous-acuminate; ovary sessile, velvety; pod beaked; seeds somewhat shining.

HAB. Encounter Bay.

Near to *P. mollis*, Lindl.

63. *Pultenæa densifolia*, F. Muell.; branchlets divaricate; leaves small, crowded, coriaceous, broadly-obovate or somewhat cuneate, stalked, glabrous, mucronulate, rarely blunt, recurved, shining above, veined beneath, margins flat, sometimes with a few hairs; stipules imbricate, nearly lanceolate, membranous, pale brown, fringed; flowers axillary, solitary, or in terminal heads; calyces membranous, little longer than the fringed, lanceolate, mucronulate bracteoles, with the exception of the margin, smooth, their teeth nearly equal, setaceous-acuminate; pods oblique-ovate, turgid, slightly silky, sessile.

HAB. In the lower Murray Desert, and near Port Lincoln, according to C. Wilhelmi.

It stands in relation to *P. parviflora*.

64. *Bossiaea egena*, F. Muell. (*Daviesia egena*, F. Muell. in Trans. of Phil. Soc. of Victoria); tall, much-branched, leafless; branches terete, erect, furrowed, unarmed; racemes very long, terminal; pedicels solitary or twin, shorter than the calyx, furnished at the top with two bracteoles, which are rounded, persistent, ciliolate, connate at the base, and larger than the lower ones; calyx indistinctly angulate, with acute teeth, the lower ones the longest; keel perfectly blunt, hardly longer than the wings; stamens monadelphous; ovary nearly sessile; style smooth; pods oblique, oblong-ovate, slightly convex, with a very short beak; seeds equally brown, with a papillous, irregular-lobed strophiole.

HAB. In the barren bushy plains along Spencer's Gulf, Lake Torrens, the Flinders Ranges, and Murray River.

65. *Bossiaea distichoclada*,* F. Muell.; erect, unarmed; branches and twigs in two rows, terete, grey-velutinous, densely foliate; leaves small,

* This is *Bossiaea foliosa* of Allan Cunningham, collected by himself near Bathurst.
—ED.

on very short petioles, bifarious, assurgent, coriaceous, nearly kidney-shaped, at the top awnless and divided into two very short lobes, their margins recurved, above scabrous, on both sides, with the exception of middle rib, glabrous; stipules ovate- or lanceolate-subulate, long persistent, at length reflexed, often of the length of the leaves; pedicels short, axillary, solitary, with rounded or ovate ciliate bracteoles; upper lip of the somewhat silky calyx bifid, lower lip three-parted; pod much compressed, roundish-rhomboid, covered with rusty down, containing from one to three brown black-spotted seeds.

HAB. In the Australian Alps, from the Mitta Mitta to the tributaries of the Snowy River, as well between rocks as along the peaty margins of the rivulets.

This singular and beautiful plant never descends to regions lower than 4000 feet; and being, at 5000, for many months during the year covered with snow, it will, like the new previously-mentioned *Burtonia*, and many other of our alpine plants, form an exquisite addition to the garden Flora of colder countries.

66. *Psoralea parva*, F. Muell.; sparingly pilose; stems herbaceous, procumbent, almost simple; leaves trifoliolate, on long petioles; leaflets narrow-lanceolate or of the radical leaves elliptical, perfectly entire, dotted, ending in a sharp point, the intermediate one larger; stipules streaked, ovate-lanceolate, with a subulate apex; peduncles long; spike at first capitate, but generally at length interruptedly extended; bracteoles roundish-cordate; calyces somewhat silky, nearly sessile; pods slightly hairy.

HAB. In dry pastures on the Thompson and Latrobe Rivers, and in South Australia, on the Torrens and Gawler Rivers, on the Barossa Ranges, near Villunga, etc.

It differs from *P. tenax* in its always trifoliolate smaller and less acute leaves, in sessile, less deeply divided calyces, in the form of the longer persistent bracteoles, in the whitish or pink corolla, and in the pod, which is neither black nor smooth.

67. *Psoralea adscendens*, F. Muell.; smooth or sparingly pilose; stems herbaceous, diffuse adscending, at the base procumbent; leaves trifoliolate, on long petioles; leaflets lanceolate, acuminate, entire, sharp pointed, dotted, the intermediate one larger; stipules lanceolate-subulate; peduncles long, upwards as well as the calyces somewhat hairy; racemes dense, almost spicate, many-flowered, of the length of

the leaflets; bracteoles lanceolate-ovate, acuminate; pods black, wrinkled-scabrous.

HAB. On the grassy moist banks of the Snowy River, Gibbo River, Mitta Mitta, Ovens River, and along the torrents of the Australian Alps.

This fine plant approaches nearer to *P. Australasica* than to *P. tenax*; the colour of the flowers is purple, like that of the former, not deep blue as in the latter, from which it differs besides in the greater size of all parts and the above notes. It may be considered a subalpine plant, whilst *P. tenax* hardly advances anywhere into the mountains.

68. *Leptocyamus sericeus*, F. Muell.; all over grey-silky; stems procumbent; leaflets lanceolate-linear, acuminate, above at length a little glabrescent; pedicels axillary, subsolitary; pods silky; seeds shining-black, even.

HAB. On sand-ridges along the Murray River, towards the junction of the Murrumbidgee.

To the same genus belongs *Zichya Latrobeana* of Meisner (in Lehmann Plant. Preiss. i. p. 94).

69. *Cassia revoluta*, F. Muell.; shrubby; leaves with a channelled rachis, and with six to ten pairs of leaflets, which are linear-lanceolate, pointed, smooth above, hairy beneath as well as along the revolute margins, a subulate gland between each pair; stipules linear-subulate; bracteoles cymbiform-ovate; peduncles axillary, about as long as the leaves, with from two to four umbellate flowers, together with the branches; pedicels and rachis pubescent; sepals ovate, glabrous, ciliate, the outer ones broader; one petal much shorter than the rest, nearly round; legume stalked, smooth, slightly arched.

HAB. On gravelly, sometimes overflown, places along the Avon in Gipps' Land.

The systematic position of this *Cassia* will be between *C. Australis* and *C. Schultesii*.

70. *Acacia tenuifolia*,* F. Muell.; procumbent or rarely erect, twigs soon terete, hispidulous; leaves scattered, opposite or sometimes fasciculate, spreading, often retroflexed, linear-subulate, rigid, pungent, nearly tetragonal from the prominent nerve, hardly tapering into the base, glandless, scabrous; stipules setaceous, persistent; peduncles solitary or twin, smooth, about as long as the leaves; heads globose, many-flowered; sepals ciliolate, nearly three times shorter than the

* Is *A. Brownii*, Benth.

four-parted corolla; pods glabrous, linear falcate, hardly between the seeds contracted; seeds shining, supported by a conduplicate thick brownish strophiole.

HAB. In dry, stony ranges near Ballarat, towards the Goulburn and Broken River. It stands in relation to *A. Brownii*, and varies like many other species with downy leaves.

71. *Acacia Wilhelmiana*,* F. Muell.; viscidulous; stems angular, puberulous; phyllodia incurved, upright, short linear-filiform, compressed, ending in a broader, blunt recurved apex, above or on both sides furrowed and furnished with two thin veins; stipules ovate, acuminate, very glutinous, deciduous or at length spinescent; peduncles axillary, solitary, shorter than the flower-heads; pods viscid, narrow, arcuate, slightly contracted between the seeds.

HAB. In the Mallee Scrub on the Murray, where it was first discovered by Mr. Wilhelmi.

Allied to *Acacia Hookeri*.†

(To be continued.)

Note on the Voyage of the NORTH AUSTRALIAN EXPLORING EXPEDITION, from Sydney to the Mouth of the Victoria River; extracted from a Letter of DR. MUELLER (Botanist to the Expedition), dated

On board the 'Monarch,' Sept. 3, 1855.

In a very few days we expect to reach our destination at the Victoria River, and as our attention then will be fully required to disembark our horses, sheep, and stores, and to protect them against the natives, I avail myself of a spare evening to address these lines to you, which will reach you *via* Singapore.

We advanced as far as Clarence Strait prosperously, except that we grounded on a shoal, partially composed of coral reefs, near Port Byron, and we had a particularly agreeable voyage through the inner passage along the Barrier reefs, so that the horses, on which the success of the expedition depends to such a great extent, suffered less from their long prison, than could have been anticipated. The necessity of anchoring for

* Is a variety of *A. nematophylla*, F. Muell. (Benth. in Linnæa).

† Is *A. ericæfolia*, Benth.

several nights at the more dangerous places on the way to Torres' Strait, as well as an afternoon's stay at Albany Island, gave me an opportunity of examining for the first time some of the tropical plants of Australia; and moreover our stay at Moreton Bay, where we received the horses and sheep for the expedition, enabled me to form also some botanical collections in the rich neighbourhood of that place.

With Mr. Gregory's consent I have packed up all duplicates and all seeds gathered at these localities, which will be sent to the Colonial Office, London, through the Honourable T. Church, Resident Councillor, Singapore. These collections are accompanied by the botanical description of such species as I considered as yet undescribed or wrongly classified, and also by lists of almost all the plants seen, but not always collected, at the respective localities. The specimens, all in one box, amount to nearly a thousand. Since I am however now of course destitute of any means of comparison, and as I am even, for want of room, very insufficiently provided with books, I must crave your indulgence with regard to some of the names of the plants adopted in the manuscripts; indeed I deem it, under these circumstances, requisite that an English botanist should compare the plants which I send with your Herbarium previous to their publication. The manuscripts dwell upon the following plants, viz.:—*Dennisonia nobilis*, *Nephelium tomentosum*, *Nephelium edentulum*, *Geigera multiflora*, *Cocculus Hookerianus*, *Polanisia insularis*, *Abutilon acutatum*, *Sida dictyocarpa*, *Euphorbia oraria*, *Phyllanthus gracillimus*, *Psoralina prostrata*, *Brachycome microcarpa*, *Lagenophora packyrrhiza*, *Soliva acaulis*, *Monenteles gnaphalioides*, *Helichrysum oxylepis*, *Kippistia riparia*, *Glycyococca tiliæfolia*, *Mitrasacme scabra*, and *Cassyta cuscuthæformis*.

Above all I am very anxious to see the Sapindaceous genus *Dennisonia* confirmed, as it may be a species only of some of Blume's additional genera of that order not inserted in Endlicher's genera. If you deemed the publication of these manuscripts necessary or desirable, it might also give a favourable opportunity of bringing some other allied new species under notice from my unpublished former manuscripts; for instance, *Cocculus Harveyanus*, etc.

It may not be quite uninteresting to sketch the vegetation on which I had lately a passing glance; for although, with few exceptions, the plants alluded to in the index were no doubt long ago collected by the late Allan Cunningham, still only a limited number of them has

been brought by him into notice ; and even when I enumerated plants common at Port Jackson, it must be deserving of remark, which of them advance to sub-tropical or even tropical latitudes. But this sketch could hardly be extended beyond the bare enumeration, and if I am at all entitled to venture any remarks upon such limited material, they must not be viewed as conclusive ; for even at Moreton Bay the briefness of our stay rendered it impossible to extend my botanical excursions beyond a few miles from the Brisbane River, and it is but justice to state, that through Mr. Hill's local knowledge, I was enabled to add many a plant to the collection, which otherwise, in such a flying visit, might have escaped my notice.

On the mainland, although not falling exactly within the tropics, the tropical forms outnumber far the rest, and in the shady ravines, full of humidity, the characteristic vegetation of the more southern latitudes of Australia almost entirely disappears. One of the most striking facts appeared to me to be the scantiness of the *Compositæ*, which form here, as in the tropical isles afterwards visited, an exceedingly small proportion of the vegetation. The genera *Soliva* and *Spilanthes* appear new to Australia ; *Sapindaceæ* and *Euphorbiaceæ* increase, as might be expected ; but *Epacrideæ* I saw represented only by a species of *Leucopogon* and *Acrotriche*, and *Proteaceæ* by *Grevillea robusta* and a *Banksia*.

Orchideæ include many terrestrial ones from the South, whilst under the influence of the genial climate also the parasitical species occur, and form a prominent feature in the vegetation. Along with them the single forms of *Platyserium grande*, the numerous *Lianas*, *Caladium*, etc., impart a luxuriance and grandeur to the scenery unusual in Australia. Mosses and Lichens are vastly on the decrease, and were almost wanting in the isles towards Torres' Strait, which promises but a very poor harvest of them on the north coast.

The dry sandy ridges and the swamps of Moreton Island produce, on the contrary, a vegetation almost alike to that of Fort Jackson, as may be observed in the enumeration which I prepared ; still *Pandanus*, *Spermacoce*, *Bruguiera*, *Mucuna*, *Canavalia*, *Vigna*, *Dioscorea*, etc., remind of the tropics. *Epacrideæ* are particularly numerous, *Tremandreeæ* wanting.

The vegetation of the islands which we visited on our way to Torres' Strait (isles off Cape Bedford, Howick's Group, Cairncross Island, Al-

bany Island) exhibits mostly plants identical with species from India or the South Sea Islands. A *Tribulus* appears to be identical with the desert species from the Murray and Darling. *Sesuvium*, *Polycarpha*, and *Polanisia*, I find unnoticed amongst Australian genera; and *Glycycocca*, intermediate between *Wallrothia* and *Vitex*, is altogether new, and not unworthy of notice, on account of its pleasant fruit; unfortunately only one specimen was found of it.

Mimusops Kauki is another fruit-plant from these localities, and occurs abundantly; in perfect maturity the fruit loses its astringency, and is then by no means to be despised. *Araucaria* was discernible on many of the islands which we passed; but, like *Callitris*, observed on none of those on which we landed. On Albany Island a single Proteaceous plant was observed, namely, *Grevillea gibbosa*, forming a tall bush or a very small tree, resembling, in its dull grey foliage, certain *Eucalypti*. *Wahlenbergia gracilis* was here also growing; and perhaps other herbaceous plants, common in extratropical Australia, would likewise be noticed at a more favourable season.

But of the most interesting points for plants yet unexplored in Eastern Australia, we had only a view, but this view close enough to be tantalizing. I allude to the high bold ranges which approach here and there on the tropical eastern coast to the sea, as Mount Hinchinbrook (3500 feet high), Mount Bellenden Ker, and Cape Tribulation. In one glance we could see displayed before us favourable landing-places, spurs for easy descent, richly wooded groves, with a varied tint of vegetation; and if I add to this the information gleaned from Mr. Carron's narrative on the lowland Flora, who discovered hereabouts, in the unfortunate Kennedy's expedition, a Pitcher-plant, a *Musa*, *Anacardium*, etc., it is then unnecessary to speak of my ardent desire to return once to localities so promising for the enlargement of our favourite science.

Our main labours are now soon to commence, and we shall be banished from civilized society for a long period. I trust that we shall be able to retain strength in the hot, enervating climate, so as to gain the great results expected from this Expedition,—results which will probably be conclusive to the whole geography of Australia; and we are happy that the choice fell fortunately upon Mr. Gregory as our leader, whose tried ability and pleasing, serene manners cannot fail to inspire all equally with confidence and devotion.

Should the botanical results to be gained during this journey be but proportionately small, which is very possible, considering the nature of the Expedition, and the probable absence of high ranges in Central Australia, I shall then *not* apply for leave of absence to return to England, but shall rather continue my labours in some part of Australia, provided the Colonial Government will again supply limited *subsidia* for that purpose. But if the Flora of the interior should prove so rich as to answer to my sanguine expectations, and if the means of transport will admit of my collecting all the species occurring there, and above all, if Providence grants me life and health for this work, then I shall be greatly cheered in my home journey to Europe by the anticipation of the pleasure of paying you personally my respects, and gaining so much information at your magnificent establishment.

Since I wrote this letter the gentlemen of the schooner landed, under Mr. Gregory, at Quail Island, where a few plants were obtained. They were the following :—*Pandanus spiralis*, *Spinifex fragilis*, *Eucalyptus* sp., *Ficus* sp., *Polycarpæa* sp., *Röttlera* sp., *Jasminum divaricatum*, *Cassytha* sp., *Tacca pinnatifida*, *Menispermum* sp. ?; a beautiful broad-leaved *Loranthus*, a prostrate *Sida* with very short pedicels, and what I consider to be a new genus of *Chrysobalanæe* (*Basistylis*). There appears also to be at that place, to judge from a few fragments, a new genus of *Polygoneæ*, but I am quite uncertain, having seen neither leaves nor fruit. In the box with specimens forwarded to the Right Honourable the Secretary of State for the Colonies you will find a Cucurbitaceous plant, named *Sicyos Cunninghamii*; since then I had time to analyze it, and observed it to belong, together with a second species, to the genus *Zehneria*. Neither of them agrees exactly with the general character in Endlicher's genus, and I have ventured consequently to describe both as distinct from the Norfolk Island plants. The other manuscripts are already packed up, so that I extract the diagnosis, in case you would be inclined to give them publication with the rest.

Zehneria Cunninghamii (*Sicyos* sp., *Cunningh. MS. ?*); ramis gracilibus, foliis indivisis deltoideo-vel sagittato-hastatis acuminatis repandis denticulatis mucronulatis, floribus monoicis utriusque sexus in axi sæpissime geminato conjuncto longe setaceo-pedunculatis, masculis triandris, femineis stamina sterilia producentibus, stigmatibus

tripartiti lobis sursum dilatatis revolutis, baccis subglobosis, seminibus compressis nigrescentibus basi obtusis margine leviter incrassatis.

HAB. In nemoribus secus flumen Brisbane, necnon in insulis sinus Moreton Bay.

Herba *Sicyos angulati* facie nisi gracilior.

Zehneria erythrocarpa; foliis palmato-quinquelobis vel trilobis, laciniis oblique lanceolatis acuminatis mucronulatis margine denticulatis, medio laciniarum basi angustata, floribus monoicis axillaribus fasciculatis breviter pedunculatis, masculis triandris, foemineis stamina sterilia producentibus, stigmatis tripartiti lobis subcordatis reflexis, baccis magnis subovatis rubris, seminibus turgidis margine crasso cinctis.

HAB. Antecedenti consociata.

Herba præeunte robustior. Folia pleraque 2-3 unc. longa. Flores masculi pæne semiunciales, foemineis paulo majores. Fructus fere pollicares, interdum vitellini, sæpius lætissime rubri, longitudinaliter albo-vittati.

Anthesis utriusque speciei sub hoc cælo perpetua.

There is amongst the plants forwarded to the Government a new genus allied to *Euphorbia*, which is furnished at the limb of the involucre, instead of scaly bracteoles, with tender white petals, or, if you like, bracteoles. I selected the name *Petalandra* for the genus.

"September 19, 1855.

Tomorrow I shall leave, in all probability, the 'Monarch,' and I close therefore this letter. Mr. Gregory will perhaps, by another way than through the hand of the Consul-General, forward the specimens; he has not yet decided upon this point. On the entrance of the Victoria River are a few plants collected; I enumerate those with which I am more or less acquainted. *Sporobolus Indicus*, *Jasminum divaricatum*, *Sesbania Australis*, *Ægialitis annulata*, *Rhizophora Mangle*, *Pandanus spiralis*, *Scævola Koenigii*, *Cycas media*, *Vitex ovata*, *Vitex triphylla* (*V. glabrata* prox.), *Melaleuca* sp., *Eucal.* sp., *Grevillea* sp., *Hakea* sp., *Per-soonia* sp., *Acacia* sp., *Monencyanthes gnaphalioides*, *Ficus* sp., *Salicornia Indica*, *Cressa Cretica*, *Careya*, *Pavetta* sp., *Asparagus fasciculatus*, *Ægiceras fragrans*, *Hemistemma dealbatum*, *Flagellaria Indica*, a species of *Dimetopia*, in which only one mericarp is developed (*D. hemicarpa*), *Eriacine* sp.; but this is the autumn, and consequently very few plants are to be observed in flower.

FERD. MUELLER.

P.S. I observe that I omitted in the list *Egialitis annulata*, which occurs on Howick's Group. *Sonchus oleraceus* and *S. asper* are, if I rightly remember, reunited in the 'Flora of New Zealand.' I beg to point out, besides the constant differences in the fruit, shape, and size of the leaves, the difference in the internal structure of the stem.

Note on the SAND-BINDING PLANTS of the Madras Beach ; by H. CLEGHORN, M.D., Professor of Botany, Madras.

Having lately been requested by the Military Board to examine the condition of the South Beach, between the Saluting Battery and St. Thome, with a view to consolidate the drifting sands thrown up near Colonel Cotton's groins, I endeavoured to estimate the comparative value of the different species of maritime plants in preventing the encroachments of the sea on the land, and in fixing the loose soil along the shore. All that seems worthy of mention has been condensed in the following short notice of these useful plants.

Of the plants growing on the Madras Beach, the species known to Europeans by the designation of "Ground Rattan" (*Spinifex squarrosus*) comes nearest to the Sand *Carex* of England in its habit of growth, creeping along horizontally, sometimes above, sometimes below the surface of the earth, emitting roots and shoots at short intervals of a few inches. It likewise possesses the advantage of being extremely tenacious of life; the shoot at every node is capable of renewing the existence of the individual as fast as destroyed, and the whole plant offers a resistance to the storm which is rarely overcome. I think this species would be nearly as indestructible from natural causes as Couch-grass, and it appears to me (after watching patches of it on the road to Ennore, where it is little disturbed), that it would speedily colonize the sand tracts spontaneously if it were only left unmolested for a year or two. The fishermen do not appreciate the conservative design of this Ground Rattan or Mat-grass, but collect it for fuel, and thus destroy their greatest protection: the reason seems to be that the spiny leaves injure their naked feet, and the turf does not answer for spreading their nets upon. On this account it would be well to propagate the other species mentioned, immediately in front of fishing villages. This grass is polygamo-dioecious, and reproduction is effected in a very remarkable manner: the male spikes, congested into an un-

bel, are carried by the wind to the female flowers, which are fascicled on a distant plant, and being light and spherical, the Dutch call them "Wind-ball" (*Windboll*).

Rumphius, in the *Herb. Amboinense*, alludes to this plant as being connected with a superstition among the natives, who, seeing the capitula carried along the shore by the sea-breeze, think they are propelled by the devil.

Ipomœa Pes-capræ of Sweet:—Goats'-foot-leaved *Ipomœa* (also known as Rabbit-weed).—Perennial, creeping to a great extent. Stems rooting at distant intervals. Leaves smooth, long-petioled, two-lobed like those of *Bauhinia*. Flowers large, reddish-purple, very handsome.—Common on the sandy beach, north and south of Madras, where it is of great use in binding the loose sand. This fine creeper is equally abundant on both peninsulas, and is also a native of Mauritius, Macao, etc., occupying the place of *Convolvulus Soldanella* of the Scottish coast. Rabbits, goats, and horses eat it, so do cows, but their milk is tainted.

Hydrophylax maritima, Linn.—Seaside *Hydrophylax*.—A straggling, herbaceous plant, native of the shore of Coromandel, where it shows its pale pink blossoms a great part of the year. The branches run over the sand (sometimes under the surface), and strike root at the joints.—Figured in Roxb. *Cor. t.* 233.

Microhyncus sarmentosus, Wight.—A widely diffused, humble plant, common all along the sea-beach, with long, flagelliform runners. It is well figured in Wight's *Illustrations*, vol. ii. t. 133.

Pupalia orbiculata, Wight.—Stem prostrate. Leaves orbicular.—An extensively spreading, procumbent plant, of which the runners occasionally measure 3 or 4 feet. It is abundant at St. Thome and the mouth of the Adyar River.—Figured in Wight's *Icones* (?).

Pandanus odoratissimus, Linn. (*Kaldera Bush*).—A large, spreading, ramous shrub, fringes the coast in many places, and is often planted in belts, but it takes up much room, forms dense thickets, and harbours venomous reptiles. This is a very strong binder, but is objectionable from its raising sand-hills, which interrupt the currents of sea-breeze to the island.

Ehretia arenaria, Griffith, which is found between 12° and 28° north latitude (*vide* Notulæ ad Plantas Asiaticas, Part IV. p. 212), appears to be widely distributed along the sea-coast, and binds together the loose sand, although in a minor degree.

The above are the sand-binding plants most frequently noticed along the Coromandel Beach. There are others, as *Pedaliwm Murex* and *Sesamum prostratum*, etc., which co-operate in the work of conservation to a minor extent; these are less widely diffused along the coast. In this notice I have only included those which seem obviously preferable for the purpose specified.

List of Sand-binding Plants:—*Spinifex squarrosus*, *Ipomœa Pes-capræ*, *Hydrophylax maritima*, *Microrhyncus sarmentosus*, *Pupalia orbiculata*, *Pandanus odoratissimus*, *Ehretia arenaria*.

NOTICES OF BOOKS.

GÉOGRAPHIE BOTANIQUE RAISONNÉE, ou *Exposition des Faits principaux et des Lois concernant la Distribution Géographique des Plantes de l'époque actuelle*; par M. ALPH. DE CANDOLLE, etc. 2 vols. 8vo. Paris.

This most important work has long been anxiously expected, no less by Botanists than by all other classes of Naturalists, for it has for some years been known that M. Alph. de Candolle was engaged upon it. It is not easy to select from a book so comprehensive, and involving the details of such a multiplicity of subjects, any one or few that could give an adequate idea, either of its extent, or of the skill and learning that have been expended upon it; nor to give even an outline of those varied attainments which eminently qualify M. de Candolle for the successful accomplishment of so great an undertaking, without detailing his career as a Naturalist, from his pupilage under his illustrious father, to the date of publication of the present work. We can only say that the result of his labour is in every way worthy of his parentage, his talents, and the many years of study he was devoted to it.

The main subject is divided by M. de Candolle into two principal divisions, together occupying two large royal octavo volumes, each containing upwards of 600 closely-printed pages. The first of these volumes opens with three chapters on temperature, light, and humidity, but is chiefly occupied with the subject of *Geographical Botany*, or the study of the species, genera, and families of plants, under a geogra-

phical point of view, a subject which extends into the second volume. This is followed by the second main division, entitled *Botanical Geography*, that is, the study of the different countries of the globe viewed with regard to their vegetation. The work is concluded with a chapter on general results, and an Appendix indicating the directions in which researches should be pursued by those desirous of advancing the study of the Geography of plants.

To give any adequate review of a work so comprehensive and elaborate as this, is obviously quite beyond both the scope and the function of the 'Journal of Botany.' We believe however that a *résumé* of the contents of the various chapters it contains will be very acceptable to our own readers, no less than to those who propose making a special study of the work itself. They are as follows:—

Book I. Preliminary observations on the *rationale* of the action of Temperature, Light, and Humidity.

Chapter 1. Plants in relation to their surrounding physical conditions.

Chapter 2. Upon some of the effects of Temperature and Light upon plants, and upon several methods of measuring the influence of these agents.—In this chapter a succession of subjects are treated as separate articles, in more or less detail. Of these the most important are,—on the temperature of the soil and of the air at certain distances from it; on the direct effect of the sun's rays; on the effects of low temperatures and of high temperatures, whether such are regarded as having no effect or as being absolutely injurious; on the effect that is immediately induced by the accession of a favourable amount of temperature; on variations of temperature; on the combined effects of temperature and the clearness of the sky; on the observations necessary for obtaining directly the sums of the temperatures above that degree which is necessary for the performance of the ordinary functions of the species.

Throughout the above-mentioned articles are scattered a multitude of tables of temperature, sunlight, and registers of the effects of these elements upon the distribution of wild and cultivated herbs, shrubs, and trees; also tables of the mean and extreme temperatures of many places on the surface of the globe, and the comparison of these with one another; on the relation of elevation to latitude and temperature; of light and shade to germinating seeds, etc.

Chapter 3 is devoted to the geographical distribution of the sums of influencing temperatures.—Under this M. de Candolle states that “The temperatures that influence each species, and that determine each of its functions, are those above a certain degree, which degree varies with every species and with each of its functions. The means of these influencing temperatures, accumulated for days or for months, year after year, differ in every locality, and are the elements of the climate of each, so far as the phenomena of their vegetation is concerned.”

BOOK II. Geographical Botany, or the study of species, genera, and families, under a geographical point of view.

Chapter 4. On the limitation of species on plains and upon mountains.—After some preliminary observations, chiefly occupied with detailing some of the obstacles to the diffusion of plants, all of which M. de Candolle believes to be overcome by them if the climate is suited to their dispersion, he proceeds to divide his subjects into—

§ 1, Limits of native species growing at the level of the sea; as absolutely determined in their advance towards the poles or towards the equator; to the eastward, and to the westward; and afterwards their relative limits are discussed. The distribution of many annual, perennial-rooted, and perennial-stemmed, etc., plants, is here given in detail, and laws deduced from them; or at least the conditions of climate apparently necessary to their healthy existence, are accurately tabulated. Excluding a host of minor and disturbing causes, the limitation of species towards the poles is summed up as indirectly due to the diminished temperature, and more directly to the excessive cold of winter, to the sudden check given in spring by accessions of cold to the young buds or flowers, or to the absence of heat at certain times impeding particular functions. With regard to the equatorial limits of the same or other species, they are generally determined by either heat or dryness, the first of which causes is more or less directly appreciable, the second is very complicated, and involves the action of Rain, Dew, Evaporation, etc.

§ 2 is devoted to the limitation of native species in ascending above the level of the sea. This is at once the most popular and perhaps the best worked of all the branches of Botanical Geography or Geographical Botany; but yet M. de Candolle truly observes that the subject is still involved and obscure, general laws are sought in vain

amongst a multitude of valuable data, appertaining to certain mountain-chains, or to certain groups of plants. Amongst the principal causes of the difficulty of coming to any satisfactory results, is said to be the limitation of the area over which one observes; a few feet of elevation being analogous to many miles of latitude, all the causes that interfere with absolute determinations of the polar and equatorial limits of plants at the level of the sea, are proportionately increased when we attempt to discover their upper and lower limits upon a mountain; to this is added, the greater facilities for accidental transport of seedlings, beyond the normal limiting line of the species, the position and persistence of snow and of fogs, the varying nature of the soil within a small area, and perhaps the density of the atmosphere; also the want of data as to the climate of alpine regions; thus, in Switzerland (the best-known alpine region of the world), we are told that there are two points alone (Saint-Gothard and Saint-Bernard), at which the monthly mean temperatures of the air at any elevation more than 600 mètres above the level of the sea have been determined.

The causes which limit the upward and downward spread of species upon mountains, are treated of in detail, under Humidity; temperature of the air, of the water, and of the upper strata of the soil, especially as affected by solar and terrestrial radiation; exposure; rarity of the air; mineral character of the soil; geological character of the mountains; isolation of mountains or their approximation in groups; duration of Snow; and finally a section is given to the relative importance of each of these causes. Critical details of the distribution of individual species follow. In concluding the subject of the upward limitation of species, M. de Candolle dwells at length on the necessity of first studying the distribution of the same species on plains, before any attempt can be made to explain their limitation on mountains.

Of the downward limits of species on mountains little is said; data are wanting, and the difficulty of observing is greatly increased; very few cases are adduced, and the general laws are supposed to be analogous to those which determine their equatorial limit. A curious article follows, upon the very different relations to one another in respect to the elevations they inhabit, that the same species affect in different mountain-systems, even when these are in the same latitude.

From the distribution of native species M. de Candolle passes to the consideration of cultivated, and here the natural cases become compli-

cated with artificial ones of all kinds, as with the history of nations, their rise and decline, their intelligence, activity, and the abundance or scarcity of food. The subject is divided into that of their Polar and Equatorial limitation, and the species principally treated of are —Barley, Maize, the Vine, and Date. Of these the Barley appears to give the most definite results, from the extent of the area over which it is cultivated, and the exactitude of the data that have been observed regarding its limits.

The chapter on the Limitation of Species is followed by concluding remarks on the causes which limit species, whether at the level of the sea or upon mountains.

Chapter 5. Form of the area inhabited by species (“*Forme des habitations des espèces*”).—This is an exceedingly curious subject, hardly capable of a very rigorous study; some species occupy nearly circular areas, others extend in one direction many times further than in another; the causes of these irregularities are to be found in the preceding chapter on the limitations of species. Of 8495 species described in the three last published volumes of De Candolle’s ‘*Prodromus*,’ it appears that only 116 extend in one direction more than four times as far as they do in the other, whilst the greater number of species appear aggregated in areas that approach a circle or ellipse in form.

Chapter 6. Aggregation and segregation of the individuals of a species in different parts of the area it inhabits (“*Répartition des individus dans l’habitation de l’espèce*”).—The principal object of this chapter is to sketch out the main features of the local distribution or Topography of plants, or the local causes that determine their absence, presence, or prevalence in different localities. Of these some are very evident, such as rocks, walls, hedges, brushwood, forest, prairies, sands, turf, cultivation, waysides, farmyards, parasites and epiphytes, melting snow, salt-marshes, fresh-water marshes, sea-water, fresh-water, warm springs, etc. Of the less obvious influencing causes are the mineralogical character of the soil, which seems to act chiefly through the mechanical nature of the medium into which it disintegrates; exposure; the circumstance of the soil having long been occupied by a species; and the agency of the animal creation. This is followed by an article on the very different localities affected by the same species. The comparative frequency of a species, or rather the comparative abundance in which a species may exist, is next discussed, the means

adopted for expressing the facts examined into, and some of the causes that appear to lead to isolation or aggregation are detailed.

The causes of aggregation are divided into those that depend on the constitution of the species and those that arise out of the conditions of the station or locality. As a question quite apart from this, the subject of the general diffusion or rarity of a species over a great extent of country, and over the whole area inhabited by the species, is discussed; and tables are given, derived from the Flora of France, from which it appears that there is a larger percentage of very common Dicotyledons than of Monocotyledons, of biennials than of annuals, of annuals than of perennial-rooted plants, and of the latter than of bushes and trees; and that of the principal Natural Families the species of *Chenopodiaceæ* are the most widely distributed, the *Orobanchææ* least so; that of *Labiataæ*, *Polygoneæ*, *Junceæ*, and *Amentaceæ*, upwards of 30 per cent. are very common plants, whilst of *Orchideæ*, *Liliaceæ*, and *Campanulaceæ*, less than 10 per cent. in each are very common; of *Orchideæ* only 2·7 per cent.

The effect of a series of years in changing the relative abundance of species next occupies M. de Candolle's attention; and under this head the important subject of the replacement of species is discussed, and a number of very curious facts on the alternation of species detailed.

Chapter 7. On the area occupied by species.—The difficulty of determining the amount of species occupying a considerable area is very great, and three methods of doing so are proposed: the first, suggested by Brown, is taking the species common to two countries the furthest removed from one another, as Australia and Europe, and assuming that they are common to all or most intermediate countries; the second consists in taking local Floras or Monographs, and finding the number of species limited to the area of which they treat, and of those that are found elsewhere; the third consists in dividing the surface of the globe into a certain number of regions as precisely defined as possible, and arranging the species into those found in one, two, or more of these regions.*

* M. de Candolle proceeds to divide the globe into fifty such regions, of necessarily very unequal geographical dimensions, but unfortunately of not sufficiently equal value as botanical regions either; this however is the most difficult part of the work, and we apprehend that the necessary data for the subdividing the globe into provinces characterized by approximately equivalent differences of vegetation hardly exist.—ED. J. B.

This article is followed by another, full of valuable comparative observations on the amount of peculiar and widely dispersed species taken from many local Floras. The author next proceeds to inquire into the areas occupied by species in relation to the families to which they belong; thus, comparing South Africa with France, 44 per cent. of the African *Chenopodiaceæ* are common to France, and only 0·3 per cent. of the *Compositæ*; whilst conversely, only 24 per cent. of the French *Chenopodiaceæ*, and 0·6 per cent. of the French *Compositæ*, are found in South Africa. The next succeeding article, on the areas occupied by species in relation to the localities they affect, he finds to be capable of much greater illustration; thus the general dispersion of fresh-water plants, marine plants, etc., is universally known, and on these and many similar facts M. de Candolle adduces a multitude of observations and of curious exceptions.

In an article on the relative magnitude of the areas occupied by annual, biennial, etc., plants, and on great or small plants, M. de Candolle states that the species of small Phænogamic plants occupy larger areas than of great, and that the same remark may be extended to the whole vegetable kingdom.

The question of the means of dispersion is naturally suggested by these inquiries. Some of the results here given are extremely striking, and quite opposed to our popular notions of adaptability and final causes; thus, that the pappus and other appendages to fruits is given to aid dispersion is universally believed, but if it be so, how startling are the facts, that of six large families, each containing a large number of species whose seeds have aids to dispersion, and also a large number of species whose seeds have none, those whose seeds have none are more widely dispersed than the others; these families are *Ranunculaceæ*, *Rosaceæ*, *Malpighiaceæ*, *Sapindaceæ*, *Combretaceæ*, and *Compositæ*. On the other hand, plants with numerous and small seeds are more widely dispersed than others.

The observations on the area occupied by species, compared with the power in their seeds of retaining their vitality, has great interest at present, now that the question of seeds retaining their vitality after being long buried in the soil is demanding a complete re-investigation. In one experiment of M. de Candolle's, the seeds of 368 species were preserved for 15 years, when 20 of each were sown; of 10 *Malvaceæ*, 5 germinated; of 45 *Leguminosæ*, 9; of 30 *Labiataæ*, 16; whilst of

10 *Scrophularineæ*, as many *Umbelliferaæ*, 16 *Caryophylleæ*, 32 *Grasses*, 34 *Cruciferaæ*, and 45 *Compositæ*, none germinated. From the consideration of a vast number of facts, M. de Candolle concludes, that the families whose seeds retain vitality longest are *Malvaceæ*, *Leguminosæ*, *Cucurbitaceæ*, *Solanææ*, and *Polygoneæ*. The presence of oil in the seed he regards as certainly obnoxious to retention of vitality in *Cruciferaæ*, *Euphorbiaceæ*, and *Compositæ*; but when the seeds are buried deeply, they may yet retain their vitality. Seeds with horny albumen, as those of *Rubiaceæ*, also quickly lose their vitality.

An article is devoted to the area occupied by species in relation to the countries which they inhabit. Meyer's* researches in South African botany, and Ledebour's on Russian, afford the data for reasoning upon this subject; of these, the South African plants appear extremely limited, and the Russian to have very wide ranges. Elaborate calculations follow, to determine the relative dimensions of the areas of the species of single well-known Natural Families.

Under the head of Phænogamic plants with very extended areas, details are given of a list of 117 species, which are found over at least one-third part of the surface of the globe; these are—

Ranunculus aquatilis, <i>L.</i>	Sonchus asper, <i>Fuchs.</i>	Potamogeton lucens, <i>L.</i>
„ repens, <i>L.</i>	Anagallis arvensis, <i>L.</i>	„ perfoliatus, <i>L.</i>
Caltha palustris, <i>L.</i>	Samolus Valerandi, <i>L.</i>	„ crispus, <i>L.</i>
Argemone Mexicana, <i>L.</i>	Menyanthes trifoliata.	„ pectinatus, <i>L.</i>
Capsella Bursa-pastoris, <i>DC.</i>	Convolvulus arvensis, <i>L.</i>	„ natans, <i>L.</i>
Erysimum cheiranthoides, <i>L.</i>	Calystegia Sepium, <i>Br.</i>	Alisma Plantago, <i>L.</i>
Nasturtium officinale, <i>Br.</i>	Hyoscyamus niger, <i>L.</i>	Sagittaria sagittifolia, <i>L.</i>
„ palustre, <i>DC.</i>	Datura Stramonium, <i>L.</i>	Luzula campestris, <i>DC.</i>
Cardamine hirsuta, <i>L.</i>	Solanum nigrum, <i>L.</i>	„ pilosa, <i>Willd.</i>
Drosera rotundifolia, <i>L.</i>	Verbascum Thapsus, <i>L.</i>	Juncus communis, <i>Ellis.</i>
„ longifolia, <i>L.</i>	Herpestes Monniera, <i>Kunth.</i>	„ bufonius, <i>L.</i>
Spergula arvensis, <i>L.</i>	Veronica Anagallis, <i>L.</i>	Cyperus polystachyus, <i>Rottb.</i>
„ saginoides, <i>L.</i>	„ scutellata, <i>L.</i>	Eleocharis palustris, <i>Br.</i>
Stellaria media, <i>Vill.</i>	„ serpyllifolia, <i>L.</i>	Scirpus lacustris, <i>L.</i>
Arenaria rubra, <i>L.</i>	Limosella aquatica, <i>L.</i>	„ maritimus, <i>L.</i>
Cerastium vulgatum, <i>L.</i>	Verbena officinalis, <i>L.</i>	Carex muricata, <i>L.</i>
„ viscosum, <i>L.</i>	Lippia nodiflora, <i>Mich.</i>	„ caespitosa, <i>L.</i>
Oxalis corniculata, <i>L.</i>	Thymus Serpyllum, <i>L.</i>	„ paludosa, <i>Good.</i>
Tribulus terrestris, <i>L.</i>	Clinopodium vulgare, <i>L.</i>	„ curta, <i>Good.</i>

* His data however require extensive modification.—ED. J. B.

<i>Trifolium repens</i> , L.	<i>Prunella vulgaris</i> , L.	<i>Alopecurus geniculatus</i> , L.
<i>Potentilla anserina</i> , L.	<i>Marrubium vulgare</i> , L.	„ <i>pratensis</i> , L.
<i>Callitriche verna</i> , L.	<i>Lamium amplexicaule</i> , L.	<i>Phleum pratense</i> , L.
<i>Hippuris vulgaris</i> , L.	<i>Plantago major</i> , L.	<i>Panicum Crus-galli</i> , L.
<i>Myriophyllum verticillatum</i> , L.	„ <i>lanceolatus</i> , L.	<i>Setaria glauca</i> , Beauv.
<i>Portulaca oleracea</i> , L.	<i>Chenopodium murale</i> , L.	„ <i>viridis</i> , Beauv.
„ var. <i>sylvestris</i> .	„ <i>album</i> , L.	„ <i>Italica</i> , Kunth.
<i>Moutia fontana</i> , L.	„ <i>ambrosioides</i> , L.	<i>Phragmites communis</i> , Trin.
<i>Daucus Carota</i> , L.	<i>Amaranthus Blitum</i> , L.	<i>Cynodon Dactylon</i> , Pers.
<i>Galium Aparine</i> , L.	<i>Polygonum aviculare</i> , L.	<i>Poa Eragrostis</i> , L.
<i>Ageratum conyzoides</i> , L.	„ <i>Convolvulus</i> , L.	„ <i>annua</i> , L.
<i>Erigeron Canadense</i> , L.	„ <i>amphibium</i> , L.	„ <i>trivialis</i> , L.
<i>Eclipta erecta</i> , L.	<i>Rumex Acetosella</i> , L.	„ <i>nemoralis</i> , L.
<i>Maruta Cotula</i> , L.	<i>Urtica urens</i> , L.	<i>Glyceria aquatica</i> , Sm.
<i>Artemisia vulgaris</i> , L.	„ <i>dioica</i> , L.	„ <i>fluitans</i> , Br.
<i>Gnaphalium luteo-album</i> , L.	<i>Lemna minor</i> , L.	<i>Catabrosa aquatica</i> , Beauv.
„ <i>uliginosum</i> , L.	„ <i>trisolca</i> , L.	<i>Briza minor</i> , L.
<i>Senecio vulgaris</i> , L.	<i>Trypha latifolia</i> , L.	<i>Dactylis glomerata</i> , L.
<i>Taraxacum Dens-leonis</i> .	„ <i>angustifolia</i> , L.	<i>Triticum repens</i> , L.
<i>Sonchus oleraceus</i> , α & β , L.	<i>Zannichellia palustris</i> , L.	<i>Trisetum subspicatum</i> , Beauv.

The conclusions drawn from the study of this list are stated to be very striking, and strongly confirmatory of the general laws laid down in the preceding articles; they are—

1. No species of Phænogamic plants extends over the whole surface of the globe; one alone, the *Sonchus oleraceus*, can perhaps exist in all climates, from pole to pole, but demands a cultivated soil or azotized humus.

2. The number of species known to occupy one-half of the globe's surface is very small, and confined to 18 species.

3. The total number occupying one-third of the surface of the globe is 117; and supposing that future researches increase it to 200, it will still form an extremely small portion of the whole Phænogamic vegetation* (about 0·001).

* That this number is capable of far greater increase than M. de Candolle supposes, we have no doubt. The progress of modern discovery is to reduce apparent species, which are founded upon characters that are peculiar only to the *individual*, or fragments of an individual, preserved in our collections. The mass of described species are in this category, so that the list in question will be increased—1, by the discovery of well-established species in countries they are not now known to inhabit; and, 2, by the union of supposed distinct species: and the numerator of the fraction expressing their proportion to the whole Phænogamic vegetation will be increased

4. The plants characteristic of different localities bear a very different proportion to one another in the list, to what they do to the whole Phænogamic vegetation.

5. The aquatic or subaquatic appear to have been dispersed widely, quite independently of the agency of man.

6. Not one tree or bush appears on the list; * the *Thymus Serpyllum* is the only approach to a woody plant.

7. The list contains 47 annuals, 3 biennials, and 66 perennial-rooted plants.

8. The great extension of continent towards the north of our hemisphere powerfully influences the distribution of many species; no less than 108 of the 117 entirely or chiefly occupy the temperate or cold latitudes of the northern hemisphere.

9. The species in the list may be supposed to have spread without difficulty from station to station on the continents; but it is worthy of remark, that every species which is widely diffused over both continents, inhabits also the intervening islands, under the same latitude. Hence it follows that the oceans were no greater obstacles to the dispersion of the plants in question, than the land was, or that the dispersion took place at a period when the islands were nearer the continents, or formed part of them; or, lastly, that the same species originated in more than one locality.

10. The species most widely diffused belong generally to families which have been already noticed in this Work, as containing species that occupy large areas: from this M. de Candolle adds a corollary, that when a family contains one or more species of unusually extended range, most of the other species of that family may be assumed to occupy considerable areas.

11. The proportion of Dicotyledons to Monocotyledons in the list is as 73 to 44; and as the whole number of known Dicotyledons to Monocotyledons is as 62 to 38, it follows that the species of Monocotyledons occupy a greater area than those of Dicotyledons.

in a double ratio, for whilst the reduction of varieties to species and the additional habitats increases the numerator, the former cause diminishes its denominator.—
ED. J. B.

* When the tropical flora is better investigated, several decidedly bushy, if not arboreous, plants, will no doubt have to be added, as perhaps *Avicennia* and other coast-species, which at present have different names in the Old and New World.—
ED. J. B.

12. The majority of the species enumerated in the list run into varieties.*

13. The seeds and fruits of the plants enumerated present no characters in common, and only 15 are distinguished by having mechanical aids to dispersion.

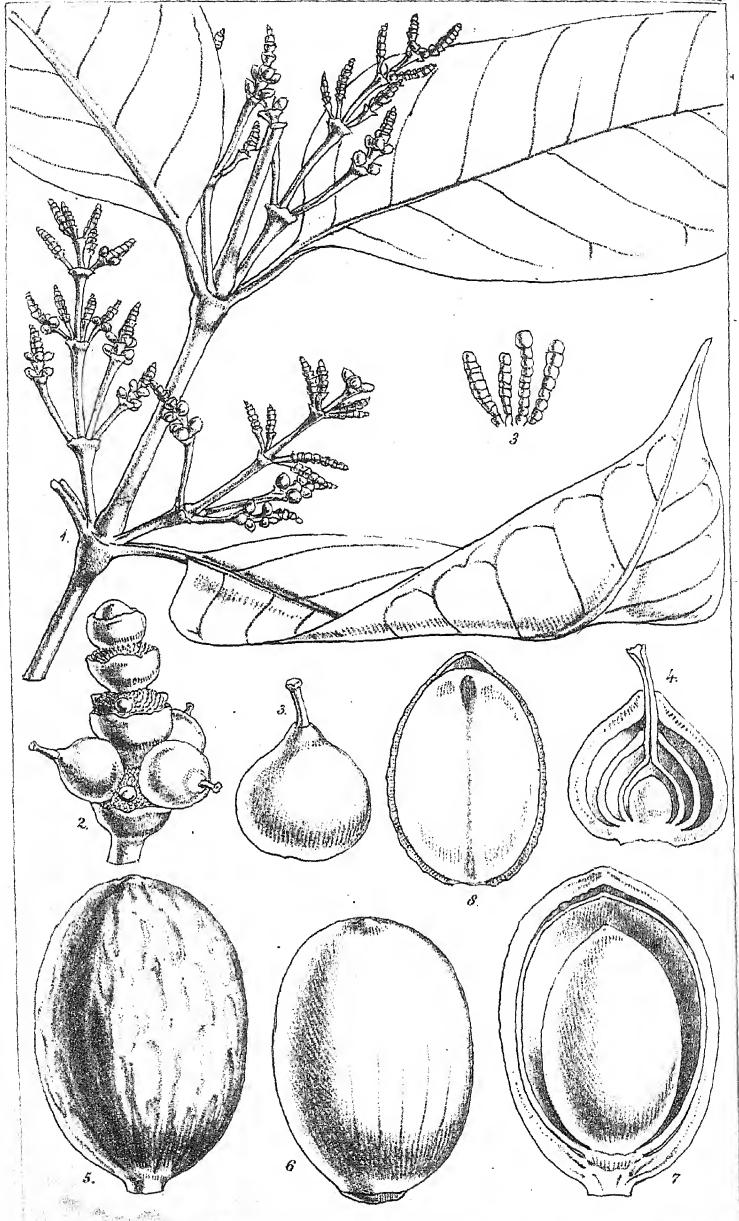
A section is given to species inhabiting very circumscribed areas. Of these, the majority of the best marked are insular, and the Islands of St. Helena, Tristan d'Acunha, Madeira, and Juan Fernandez, and the Gallapagos, present conspicuous examples. Of continental European species, the most remarkable are *Campanula excisa*, Schl., and *isophylla*, Moretti; *Lithospermum Gastoni*, A. DC.; *Omphalodes littoralis*, Lehm.; *Linaria Candollei*, Chav.; *L. thymifolia*, DC.; *Scrophularia Pyrenaica*, Benth.; *Wulfenia Carinthiaca*, Jacq.

A section treats of the mean area occupied by species, a subject far too loose to admit of any accurate data being established from it; it is followed by another, on the causes that determine the relative extent of the areas occupied by species. Towards the solution of this question little can be done beyond co-ordinating facts; there has been much false reasoning on it, as M. de Candolle truly says: thus, that aquatic plants occupy greater areas than terrestrial, is a fact that admits of no solution in the present state of our knowledge; it has been ascribed to the fact of the temperature of water being more equable than that of land; but this is wholly unsatisfactory, for the same water-species inhabits marshes in Italy and in Sweden, whilst different land-plants inhabit equatorial regions that have a similar temperature and climate.

The first volume terminates with observations on the causes that determine the extension or non-extension of species; on the mode of discriminating between botanical or physiological and geographical causes, and between modern or existing and anterior or suppressed causes of extension; and lastly, with an elaborate application of these principles to known facts.

(To be continued.)

* Perhaps the most significant observation in this valuable Work, and one that is pregnant with results, when philosophically applied to the whole question of species.—ED. J. B.



Definitions of Rare or hitherto Undescribed AUSTRALIAN PLANTS, chiefly collected within the boundaries of the Colony of Victoria; by Dr. FERDINAND MUELLER, Government Botanist for the Colony of Victoria.

(Continued from p. 46.)

XVI. HALORAGÆ.

72. *Pelonastes tillæacea*,* F. Muell.; leaves short, somewhat blunt, as well as the sepals, entire; flowers all sessile, the male ones with four stamens; carpels minutely and scantily verrucose.

HAB. In wet localities of the Emu Flat, near St. Vincent's Gulf.

73. *Haloragis acutangula* (Sect. *Cercodia*), F. Muell.; stem perennial, erect, angular, branched; leaves scattered or sometimes opposite, lanceolate-linear, flat, beyond the middle furnished with linear-subulate remote serraturæ, on the margin denticulate-asperous, on both sides glabrous, but, like the stem, slightly asperous; floral leaves entire; flowers hermaphrodite, with eight stamens and four stigmas, generally sessile in the axils of the upper leaves, solitary or glomerate, thus forming a long foliate spike; lacinia of the calyx cordate-deltoid, acuminate, of less than half the length of the glabrous petals; fruit large, acute-quadrangular, glabrous and smooth, with four cells, the angles keeled.

HAB. On ridges about Port Lincoln, *O. Wilhelmi*.

It agrees best in its characters with *H. racemosa* (Labill. Nov. Hol. i. p. 100, t. 128).

XVII. LYTHRACEÆ.

74. *Ammannia Australasica*,† F. Muell.; annual, glabrous; stem erect, simple or branched, square; leaves ovate- or linear-oblong, blunt, with a dilated base clasping; cymes axillary, on very short peduncles, or rarely the flowers solitary in the axils; calyces cup-shaped, with four very short acute teeth and four indistinct ones alternating with them; petals four, nearly lanceolate, flavescent, very soon falling off; stamens four; capsule globose, extremely thin, one-celled.

HAB. On boggy places, periodically under water, along the Rivers Murray, Darling, and Murrumbidgee.

* *Myriophyllum integrifolium*, Hook. fil., Flora of Tasmania.—ED.

† Apparently an Asiatic species, though not *A. multiflora*.—ED.

twigs and the tube of the calyx hirtellous; bracteoles shorter than the pentagonal tube of the calyx, connate to the middle and apiculate by the excurving carina.

HAB. In rocky, arid declivities of the Grampians, the Serra, and Victoria ranges.

Var. *β*, *glabra*; dwarf; leaves almost smooth.

HAB. On the subalpine summit of Mount William.

I do not hesitate to refer to this species *Genethyllis alpestris* of Lindley (in Mitchell, Three Expeditions, vol. ii. p. 178), described from specimens collected by Sir Thomas Mitchell on Mount William. These specimens, transmitted to Professor Lindley, were probably not well developed, being gathered in the month of June. Examining the plant last year in the month of November, I became convinced that it belongs to the genus *Lhotskya*. I have not retained the specific name *alpestris*, as the plant occurs most abundantly on the lower parts of those mountains, and in localities much exposed to the hot north-westerly winds.

XIX. CUCURBITACEÆ.

82. *Cucurbita micrantha*, F. Muell.; stems prostrate, angulose, simple, as well as the petioles strigosely asperous; leaves subcordate, with five short, blunt, dentato-sinuate or incised lobes, on both sides hirtello-asperous, on the margin and beneath along the nerves densely strigulose; tendrils short, undivided; peduncles axillary, filiform, fasciculate, much shorter than the petiole, with the calyx pubescent; flowers monœcious; berries globose, even, smooth, many-seeded.

HAB. On the sandy-loamy banks of the Murray, sometimes washed by the floods.

The fruit might, on account of its intense bitterness, perhaps be substituted for *Colocynth*.

XX. PORTULACÆÆ.

83. *Mollugo Novæ-Hollandiæ*, F. Muell.; stems numerous, prostrate, dichotomous; leaves pseudo-verticillate, unequal, spatulate-lanceolate, at the top indistinctly serrulate, finally glabrescent, young ones together with the branches woolly-pubescent; flowers triandrous, pseudo-verticillate; sepals blunt, a little longer than the ovate capsule and about equal in length to the pedicel; seeds reniform-ovate, shining-brown, densely seriato-granulate.

HAB. On the sandy, sometimes inundated, banks of the Murray.

This presents the first Australian species of this genus, and must be systematically placed next to *M. hirta*, from the Cape of Good Hope.

XXI. PARONYCHIEÆ.

84. *Mniarum singuliflorum*, F. Muell. (*Scleranthus mniaroides*, F. Muell. collect.); stems cæspitose, somewhat flaccid; leaves upright or little patent, as well as the branches smooth, lævigatæ; peduncles one-flowered, at the top bibracteate; calyx turgid, five-cleft.

HAB. On bare rocks at the summit of the Cobboras Mountains, 6000 feet above the level of the sea.

Easily to be distinguished by the above notes from *M. biflorum* (*M. fasciculatum*, R. Br., *S. Mniarum*, F. Muell.), the only known species, and like this varying in the length of the peduncles. By the constantly five-cleft calyx of this kind, *Mniarum* becomes so closely allied to *Scleranthus*, that hardly any objection can be raised against the conjunction of the two genera.

XXII. CUNONIACEÆ.

85. *Bauera sessiliflora*,* F. Muell.; hirsute; leaves lanceolate or sub-ovate, generally entire; flowers axillary and terminal, sessile, pseudo-verticillate; calyces to the middle eight-cleft, with subulate-lanceolate or linear segments, and with a slightly ribbed obconico-cylindrical tube; petals purple; stamens about twelve; anthers oblong-ovate, emarginate, black.

HAB. On the rocky, subalpine summit of Mount William, and thence descending along the rivulets into the valleys.

Flowers larger and of a much deeper colour than in *Bauera Billardieri*.

XXIII. UMBELLIFERÆ.†

86. *Hydrocotyle pterocarpa*, F. Muell.; subglabrous; stems creeping; leaves orbicular-reniform, indistinctly five- to seven-lobed, crenulate-repand; stipules broad, membranaceous, not fringed; petioles longer than the downy, solitary peduncle; umbels generally many-

* Not different from *B. rubioides*, Andr.—Ed.

† Two other *Umbellifere*, *Dichopetalum ranunculaceum* and *Microsciadium cuneifolium*, are described by Dr. Mueller at Vol. VII. of this Work.—Ed.

flowered, nearly capitate; fruits didymo-obcordate, much compressed, broad-winged, even, with a rib on each side of the mericarps.

HAB. From Mount Disappointment to the Ovens River, on rivulets.

Allied both to *H. peduncularis* and *plebeja*. Sometimes viviparous.

87. *Hydrocotyle geraniifolia*, F. Muell.; subglabrous; stems long, diffused, lax, partially rooting; leaves three- to five-parted, the lower ones peltate; segments of all divaricate, ovate or linear-lanceolate, grossly and unequally serrate or lobed, gradually narrowed into the apex, cuneate at the base; stipules membranaceous, fringed; petioles shorter than the thread-like, sometimes divided, peduncles; umbels many-flowered; pedicels capillary, much longer than the flowers; fruits kidney-shaped, didymous, compressed; mericarps winged at the back, with a rib on each side, and a semicordate excavation at the commissura.

HAB. In moist valleys of Mount Disappointment, of the Dandenong Ranges, and thence to the western part of Gipps' Land.

Its systematic position is near *H. quinqueloba*.

88. *Pozoa fragosea*, F. Muell. (*Fragosa hydrocotylea*, F. Mueller, coll.); glabrous; rhizome thick, creeping, with numerous long fibres; stems very short, prostrate; leaves herbaceous, long-petiolate, orbicular-reniform, net-veined, divided scarcely to the middle into five to nine crenulate lobes; stipules broad, membranous, torn; umbels sessile on the base of the petiole or pedunculate, capitate, generally many-flowered; leaflets of the involucre five to eight, connate, lanceolate, with a few setaceous lobes; teeth of the calyx deltoid-ovate, somewhat acuminate, nearly acute; petals greenish; carpels ovate, compressed on the back, with five hardly prominent ribs, strongly contracted at the axis.

HAB. Under the shade of rocks on the highest tops of the Munyang Mountains, but of rare occurrence; 6000 feet.

I assigned to this plant a place in the genus *Pozoa*, on account of the great resemblance with *Pozoa reniformis*, *P. Ranunculus*, and *P. trifoliata*, but cannot suppress my opinion that *Pozoa* and *Azorella* rank only as groups of one large and polymorphous genus, namely, *Fragosa*.

89. *Dimetopia* (Sect. *Eriosciadium*) *eriocarpa*, F. Muell.; dwarf, downy; leaflets of the involucre as long as the rays of the fruit-bearing umbel, narrow-lanceolate or linear; mericarps equal to each other, on

either side rugulose and covered all over with a thick, white, woolly tomentum.

HAB. On barren stony ridges near Cudnaka, in the neighbourhood of Lake Torrens.

90. *Seseli* (Sect. *Euseseli*) *algens*, F. Muell.; glabrous, glaucous; stems several, generally decumbent, herbaceous, simple, from a perennial root; petioles with an ample vagina; radical leaves simply pinnatisected; segments trapezoid, trifid or the upper ones cuneate, all in front deeply and acutely toothed, often lacinated; leaves of the stem from one to three, pinnatisected; rays of the umbel four to five, unequal, furrowed, glabrous; bracts one to three; bracteoles several, both setaceous; fruit glabrous, truncate-ovate, with very prominent ribs.

HAB. On the gravelly borders of alpine rivulets and springs in the Munyang Mountains; 5-6000 feet.

The want of ripe fruit of this plant leaves some doubt about its true generic position. It is unquestionably allied to *Seseli Harveyanus*.

91. *Seseli* (Sect. *Euseseli*) *Harveyanus*, F. Muell.; glabrous; stems several, erect, herbaceous, simple, from a perennial root; petioles of the stem with an ample vagina; radical leaves pinnatisected; upper segments lanceolate- or broad-linear, undivided, gradually pointed; the lower ones to the middle or nearly to the base two- or three-cleft or again pinnatisected; leaves of the stem simply pinnatisected or undivided; umbel with four to eight unequal, angulate, glabrous rays, and with a solitary or without a bract; bracteoles one to three, linear-setaceous, unmarginated, sometimes wanting; fruit glabrous, oblong, somewhat compressed, with sharp prominent ribs and solitary vittæ in the interstices.

HAB. In alpine and subalpine meadows from the Cobboras to the Munyang Mountains; 4-5000 feet.

Not dissimilar to *Seseli Pallasii* from Russia, offering a new and unexpected connecting link between the Australian plants and those of northern countries, since the genus was very scantily hitherto represented in the southern hemisphere, and quite unknown in Australia. The whole plant is of sweetish aromatic taste, reminding of Fennel and garden Chervil, and might, I think, be cultivated to advantage.

92. *Gingidium glaciale*, F. Muell.; diœcious; stem robust; leaves rigid, in outline almost ovate, bi- or tripinnated; segments hardly spreading, broad-linear, undivided, acute, mucronate, streaked, as well

the rachis channelled and transversely articulated ; umbels many-rayed ; carpels equal, semiterete.

HAB. In the higher regions of the Australian Alps ; not rare ; 5-7000 feet.

The strange rigid foliage attracts the notice of all travellers who have penetrated into these mountains.

93. *Gingidium simplicifolium*, F. Muell. ; diœcious ; leaves rigid, undivided, elongate-linear, articulated, perfectly blunt, somewhat channelled ; lower umbels few-rayed, supported by an undivided, large, vaginated leaf.

HAB. In moist, grassy, subalpine meadows, from Mount Wellington to the Munyang Mountains.

It is certainly very singular that the species of *Anisotome* or *Gingidium* should be all endemic. Their striking feature is highly developed by gigantic species in Campbell's and Auckland's Islands, reappears by numerous distinct forms in New Zealand, but is wanting in Tasmania.

XXIV. ARALIACEÆ.

94. *Panax angustifolius*, F. Muell. ; fruticose, unarmed, glabrous ; leaves simply or bipinnate ; leaflets spreading, carnulent, in three to seven pairs, oblong-linear, perfectly entire or sometimes again dissected, almost veinless, opaque, above dark green, beneath pale ; umbels distant in the panicle, pedunculate, many-flowered ; calyx obsoletely toothed ; styles two, reflexed at the extremity.

HAB. Dispersed through the mountains from Dandenong and Mount Macedon to the Buffalo Ranges, and through a great part of Gipps' Land.

The berries are bluish-white, like those of the following species, but somewhat smaller.

95. *Panax dendroides*, F. Muell. ; arborescent, unarmed, smooth ; leaves simply or bipinnate ; leaflets in five to seven pairs, lanceolate, acute, entire, opaque, beneath paler, above with prominent veins ; umbels many-flowered, forming a divaricate panicle, which is of equal length with the leaves ; calyx with five short teeth ; styles two, reflexed from the base.

HAB. Not rare in the valleys of the southern and eastern ranges of this Colony.

(To be continued.)

On DUTTONIA, a new Genus of Myoporineæ from South Australia ;
by DR. F. MUELLER, Government Botanist for the Colony of Victoria.

(Plate I.)

DUTTONIA.*

Gen. Char. Calyx profunde 5-partitus, persistens; laciniis patentibus, lineari-subulatis. Corollæ intus dense barbatae tubus brevis, cylindricus; faux ampliata; limbus bilabiatus, labio supero acute bidentato, infero tripartito. Stamina didynama, inclusa, filamentis 2 supra corollæ basin insertis, 2 cæteris brevioribus; antheræ biloculares, loculis divaricatis. Stylus simplex, glaber, stamina superans, apice uncinatus. Ovarium oblongum, 2-4-loculare, loculis 2 fertilibus; ovulis solitariis, apice loculi pendulis. Capsula oblonga, obtusissima, leviter compressa, calyce brevior, bilocularis, loculis incomplete bilocellatis. Semina in locellis solitaria, linearia.—Frutex ora meridionalis Novæ-Hollandiæ, facie Eriostemonis gracilis.

1. *Duttonia gibbifolia*, Ferd. Mueller.

HAB. In montibus petræis juxta rivulum "Mount Barker Creek" (Coloniae "South Australia").—Anth. vere.

Frutex hirtellus v. puberulus, patentim ramosus, ramis tenuibus teretibus, ramulis subhirtellis. Folia alterna, demum decidua, lineari-oblonga, subacuta, puberula, plano-convexa, coriaceo-carnosa, enervia, sessilia, sed non decurrentia, ramulis appressa, $1\frac{1}{2}$ –2" longa, scabra, supra impressa, subtus convexa, tuberculis confluentibus distinctisve gibba, iis igitur *Eriostemonis gracilis* et *halmaturorum* non absimilia. Flores axillares, sessiles. Calycis laciniæ e latiore basi tenuissimæ, 2" longæ, patentim recurvatae. Corolla calycem duplo superans, extus et prope basin intus glabriuscula, lobi labii superioris fere deltoidei vix lineam longi. Capsula ad apicem valde compressa, 2–3" longa, glabriuscula, indehiscens?

Plate I. Fig. 1, leaves; 2, portion of branch, leaves, and flower; 3, flower laid open; 4, stamen; 5, immature fruit :—all magnified.

* *Duttonia*, Sonder, antea in *Linnaea*, xxv. p. 409, divulgata, sed jam anno 1851 descripta, *Dimorpholepidi* jure prioritatis subjungenda est.

Balsam-bog (*Bolax glebaria*, *Comm.*); by SIR W. J. HOOKER, K.H.,
F.R.A. and L.S.

Among the most remarkable of plants peculiar to the Polar and sub-polar regions of the Southern hemisphere, will undoubtedly rank the *Bolax glebaria*, first discovered by Commerson in Tierra del Fuego; in Good Success Bay by Banks and Solander; by Mr. Webster in Staten Land; by Dr. J. D. Hooker in Hermite Island; and by Pernetty, Gaudichaud, and D'Urville in the Falklands, where it is familiarly known to the English settlers under the name of "Balsam-bog," but is called "Gommier" by the French voyagers. It is also in great perfection in Patagonia, and even on the Andes of Peru and Bolivia, according to Dr. Weddell. In 1764, when the French formed an establishment on the Falkland Isles, the Abbé Pernetty, the historian of the voyage, speaks thus of the face of the country on the first landing:—"Deceived by distance, we had expected to find a perfectly dry and barren country; but no sooner had we set foot on *terra firma*, than we saw everywhere a tufted herb, a foot or a foot and a half and more high, growing even upon the loftier hills, which we had great difficulty in ascending, from the obstacle which this plant opposed to our progress. Our fatigue was excessive. There were no tracks among this herb, which appears to have vegetated there since the foundation of the world. We broke into the decaying masses formed by it, up to our knees; and the soil beneath, nearly black, was but the vegetable detritus of the decayed shoots of successive years, which felt elastic under the feet in consequence of the interwoven roots. . . . Luckily we had provided ourselves with small sealed bottles of brandy and a few ship-biscuits, which proved of great use in supporting our strength under the heat and fatigue which we endured."

Pernetty, a few days after, speaks of the resinous qualities of this herb; and its abundance upon a little island, which they afterwards named *Ile Brûlée*, because the Commander of the expedition, M. de Bougainville, ordered fire to be set to these plants, "pour rendre plus facile le défrichement des terres," notwithstanding the remonstrances of M. Pernetty, who represented that "tout le pays étant couvert de foin, le feu gagneroit de proche en proche, peut-être même toute la surface de la Terre-ferme, s'il n'étoit pas arrêté par quelques rivières; que d'ailleurs ce feu détruiroit tout le gibier." The fire was repeated

on the mainland, and "les Gommiers" continued burning for some days. The new colonists afterwards made a better use of these great hillocks of vegetable resin, as fuel in cooking their provisions.

The nineteenth chapter of this interesting voyage is devoted to the "Natural History of the Islands;" and the very first object noticed, and described with remarkable accuracy for one who makes no pretensions to a scientific acquaintance with the works of Nature, is this plant. "The productions of the soil," he says, "are amongst the first objects which attract a physical traveller on landing on the Iles Malouines [the French name for the Falklands]. There are, on the heights, massy green lumps, or hummocks, sometimes rising three feet and more above the soil. I studied attentively one of these hillocks, and I observed that there exuded a resinous gum, at first white when it is soft, but amber-coloured when dry. I collected several grains, and found them to yield an odour at least as strong and as aromatic as that of incense; but, at the time, I could not determine the precise relationship this exudation bore to other known resins or gums. I brought away with me about the weight of a 'demi-gros' in drops, some of the size of a round pea, others as large as a kidney-bean; and on my return to the ship I exposed some on the point of a knife to the flame of a candle. The substance blazed like a fine resin, exhaling an agreeable odour, and depositing a black oil, which was not inflammable, and which, when cold, became hard and brittle. I tried in vain to dissolve this oil in water, and was hence led to consider that it would make an excellent varnish. M. Frontgousse, surgeon of the 'Sphinx,' having collected some of this gum, imagined from the odour and from the taste that it was gum ammoniac; and on comparing the two, we found the same taste and the same smell, and the same residuum on burning. The odour is so permanent on the fingers, that during the whole of that and the following day I could not remove it, though I washed my hands repeatedly, and even with salt-water. In spirits-of-wine this gum-resin dissolves only partially, and tinges the spirit with the colour of amber: what remains becomes spongy, and burns as before it was dissolved: the third residuum does not dissolve in water; aquafortis has no effect upon it.

"These hummocks are *formed by one single plant*, which throws out light spongy stems, whose lower foliage gradually decays, like that of a Palm. The leaf is cut into three segments (accurately represented

in a very rude figure); it is of the size of the Water Purslane, but of a fine green colour. These leaves are much crowded all round the stem, and each is slightly umbilicated in the centre. Collectively these tufts form, at the apex of the branch, a kind of depressed pyramid, composed of leaves placed close to each other in an imbricated manner, like the scales of an artichoke. [The Abbé's bird's-eye view of the apex of a branch is also correctly rather than elegantly figured.]

"From the heart or centre, and from the torn edges of the leaves, or if they are only chafed, or at seasons when the plant is surcharged with resinous liquor, this gum-resin exudes, and congeals in the air. When the plant is cut or torn, or merely rubbed on the surface, a white, creamy, and viscid substance flows, which sticks to the fingers like glue, and is very adhesive.

"The interior of these hummocks is hollow, the crust or surface supported, as it were, by the stems and the branches, of which the leaves, not exposed to the air, are brown and decayed; *sometimes other plants vegetate in the interior of this vault*, emerge into daylight through the mass, and flourish above it. When these lumps are perfect, they are very firm and solid, so as not only to bear a man seated upon them, but the whole weight of a man in walking over them; nevertheless a sudden and violent kick of the foot easily breaks into this hollow, and with the hand large masses may be wrenched away. The broken roots and stems also yield the same white resin, which flows from the wounds like the milky juice of an *Euphorbia*."

Lastly, towards the close of the same chapter, after describing other plants, M. Pernetty reverts to his favourite *Gommiers*, in connection with a kind of Heather, evidently the *red-fruited Crowberry* (*Empetrum rubrum*). "It is found very commonly growing out of the *Gommiers*, in such a manner as to lead to the belief that it is a branch (or tuft) of the same plant, with different leaves, and bearing (scarlet) fruit."—"This *Gommier* is only green upon the surface, because the leaves scarcely exceed a quarter of a line in length; they are, so to say, glued together and arranged in a rose-shaped manner. The flower so much resembles the seed-vessel as easily to deceive one. This capsule very much resembles that of Anise, but it is 'd'un gris de terre.' I have seen hummocks of this plant more than ten feet in their widest diameter, and four and a half feet in height; ordinarily they assume a nearly spherical form, but the largest have the form of a potato cut through the middle."

Probably the Abbé Pernetty, though likening the small fruit to that of the Anise, had not the most distant conception that it belonged to the same Natural Family, viz. the *Umbelliferæ*; the habit, aspect (or port) of the plant being so exceedingly unlike any Umbellifer of the northern hemisphere. Some of the densely-tufted alpine Saxifrages, with divided leaves, have more the appearance of this singular production, but on a very small scale. From a sketch made by Dr. Hooker on the spot, there is a woodcut, published in Sir James Ross's 'Voyage to the Southern Seas,' vol. ii. p. 303; and that is, as far as we know, the first and only figure* which represents a group of these plants *in situ*: and the most accurate representation of a small portion of a hummock, and its botanical analysis, are those given in the 'Icones Plantarum,' vol. v. tab. 492; by which it will be seen that this huge plant, when in its original and most perfect state, namely, with root, stem, flower, and fruit, is yet among the smallest of the Natural Family *Umbelliferæ*; and that the great bulk of these large specimens is due to the successive prolongations of the apices at the surface of hummock, all rising from one original root. The 'Flora Antartica' of Dr. Hooker, again, enumerates all the synonyms of the plant: so that we have no need to offer a scientific description of it on the present occasion. It will be more to our purpose to offer an extract from the most recent author on the subject, in the work last mentioned (vol. ii. p. 286).

"Long before the Falkland Islands were colonized, from Britain," says Dr. Hooker, "the present plant had excited considerable curiosity, by the remarkable mode of growth it there assumes, and its forming a feature in the landscape, that strikes the most casual observer. Now that these islands have been annexed formally to the British dominions, the *Bolax*, or *Balsam-bog*, assume a still greater interest. In whatever portion of this country the voyager may land, he cannot proceed far along the beach without entering groves of *Tussac* or *Tussock* (*Tussac-grass*, *Dactylis cæspitosa*), whose leaves often wave over his head; nor turn his steps inland without seeing, scattered over the ground, huge, almost spherical, hillocks, of a pale, dirty yellow-green colour and uniform surface, so hard that one may break the knuckles on them. If the day be warm, a faint aromatic smell is perceived in their neighbourhood, and drops or tears of a viscid white gum are seen to flow from

* Copied, and coloured to the fancy of the artist ("J. C. Frank del. et lith."), in the 'Popular Geography of Plants,' lately published.

various parts of this vegetable mass. The plants stand apart from one another, varying from two to four feet in height, and though often hemispherical, are at times much broader than high, and from eight to ten feet wide in the greatest diameter. The very old ones begin to decay near the ground, where a crumbling away commences all round; and having but a narrow attachment, they resemble immense balls or spheres, laid upon the earth. Upon close examination, each mass is found to be herbaceous throughout, the outer coat formed of innumerable little shoots, rising to the same height, covered with imbricated leaves, and so densely packed that it is even difficult to cut out a portion with a knife, while the surface is of such uniformity that Lichens sometimes spread over it, and other plants vegetate on its surface, in the occasional holes or decayed places.

“ If at a very early period a young plant of the *Bolax* be removed and inspected internally, the origin of these great balls may be traced; for each of them, however large, is the product of a single seed, and the result of many, perhaps hundreds of years' growth. In a young state, the plant is furnished with a very long, slender, perpendicular root, like a whip-lash, that penetrates the soil, producing at its summit two or three small branching stems, which divide again and again, radiating regularly from the centre, instead of being prolonged vertically; these send out lateral shoots from their apices, and in such numbers that the mass is rendered very dense, and by the time the plant has acquired the diameter of a foot, it is quite smooth and convex on the surface. The solitary root has become evidently insufficient for the wants of the mass of individuals, which are now nourished by fibrous radicles, proceeding from below the leaves, and deriving nutriment from the quantity of vegetable matter which the decayed foliage of the lower part of the stems and older branches affords. The species yields a gum, which is white when oozing from the stems and leaves, but soon turns red-brown on drying. It has been used as an application to cuts and other lesions with apparent effect.”

Living, or dead and dried, it could not but be desirable that so remarkable a vegetable production should be brought to England; but all our attempts to procure it were in vain till the present time (February, 1855), when the late Governor of the islands, George Rennie, Esq., had the extreme kindness, and with no small labour and expense, to bring home with him a very fine specimen for the museum of the

Royal Gardens, Kew, and in the most perfect state of preservation. At the railway station this single box, with its solitary specimen (including the soft packing materials, filamentous Lichens,) was found to weigh 547 lbs. Deducting the strong case, 234 lbs., and the soft packing, 10 lbs., we have 303 lbs. as the actual weight of the specimen. It was an interesting occupation for stay-at-home travellers to witness the opening of the case. The very packing-stuff had charms for the Cryptogamic botanist, consisting, as just observed, of the filamentous Lichens of the country; they consisted of noble specimens of the *Usnea melanantha*, Ach. (figured in Hook. Bot. Misc. vol. i. p. 15, tab. 2, under the name of *Usnea sphacelata*, Br., a species both Arctic and Antarctic, and inhabiting the higher mountains of the Andes even under the Equator), several states of the ubiquitous *Usnea barbata* and *plicata*, together with many remarkable varieties of *Ramalina scopulorum*, severally in copious fructification; and no better package could possibly have been employed. They retained a certain degree of moisture, were soft and elastic, not in the least disposed to heat or decay; all looked as fresh and as bright-coloured as if they had been that day gathered from their native rocks,—a lesson for those who have occasion to pack many living plants for long voyages.

On the removal of the Lichens the hummock of the *Bolax glebaria* came fully into view, exactly corresponding with the general descriptions extracted above from the writings of the Abbé Pernetty and Dr. Hooker; its broad base rested firmly on the bottom of the box: it required four men to remove it. Its shape is an irregular hemisphere, 2 feet high, 3½ feet broad in its greatest diameter; the circumference at the base 10 feet; and it measured from side to side, carrying the line over the summit, 6 feet 3 inches. Externally it forms a compact, nearly even crust, consisting of the stellated or rosulated ultimate shoots of the plant, so closely packed that not a pin's breadth of vacancy can be perceived between them. Beneath is a cavity, how deep we know not, occupied by decayed vegetable matter, the detritus of former years, root and stem and leaves,—a perfectly black soft mould. This has not only afforded nutriment to the surviving limbs of the parent plant, but to a foreigner also; for, exactly as described by Pernetty, there has emerged from the side of the crust, near the base, a very fine specimen of the *Empetrum rubrum* (an exact representative of our northern Cranberry, *Empetrum nigrum*, only bearing red

instead of black berries), a tuft a foot in length; and from the very summit of the *Bolax* rises another specimen of *Empetrum*, forming a crest to the hummock.

The specimen is accompanied by a bottle filled with the gum-resin, in its present state of a dirty amber-colour, odorous, firm, but moderately soft, and very adhesive, becoming fluid with heat.

We should do injustice to Mr. Rennie did we not also acknowledge his attempts to bring home young living specimens of this rarity. Several were placed in a Wardian case and carefully attended to on the deck of the vessel, and conveyed safely as far as the latitude of Portugal; when such a storm came on as swept the decks of every movable object, and compelled the Captain to put, in distress, into Lisbon, whence the Governor, with the remainder of his treasures, soon proceeded in the mail-steamer to England. Mr. Rennie has set a good example for his successors to follow; and as the Royal Gardens now possess living plants of the *Tussac Grass* and the *Antarctic Beeches* from the high southern latitudes; the *African Teak* from the interior of Sierra Leone; the *Rice-paper*, from Formosa; the *Wax-Palms* and *Phytelphas*, from South America; the *Ouvirandra fenestralis*, from Madagascar, etc.,—plants almost despaired of in former years,—so we are sure some kind friend will ere long supply us with vegetating specimens of *Bolax glebaria*.

A box separate from the one above mentioned, brought to us also by Mr. Rennie, contains museum specimens of the following rare and very remarkable Seaweeds, peculiar to those southern latitudes:—1. *D'Urvillaea Harveyi*, Hook. fil. (Fl. Antarct. vol. ii. p. 456, tab. 165 and 166); 2. *Lessonia fuscescens*, Bory (Hook. Fl. Antarct. vol. ii. p. 457, tab. 167, 168, and 171); our stems below branching at the top, measure 12 feet in length; this seaweed grows upright and forms submarine forests with its copious floating foliage. Sections of the stems are used for knife-handles by the Gauchos, and become hard and transparent like horn. 3, 4. *Lessonia nigrescens*, Bory, and *L. ovata*, Hook. fil. and Harv.,—probably too near *L. fuscescens*. 5. *Macrocystis pyrifera*, Ag., whose stems are said to attain, at a moderate computation, a length of seven hundred feet!—the longest of any known plant.

BOTANICAL INFORMATION.

Herbarium of the Two RICHARDS.

The present possessor of the very extensive Herbarium formed in Paris by the talented Claude Louis Richard and his late son, Professor Achille Richard, being about to be absent from France for a considerable length of time on a voyage to America, has come to the resolution to dispose of the collection; in what particular manner is not yet stated; but we are requested to announce in our Journal the following general list of its contents:—

1. *Herbier général*, classé suivant le 'Genera Plantarum' de A. L. De Teyssieux, avec un catalogue. 27,150 espèces environ.
2. *Herbier de l'Ile de Cuba*, plantes récoltées par M. Ramon de la Sagra, ayant servi à la publication de la Flore de l'Ile de Cuba, par A. Richard. 4464 espèces environ.
3. Doubles et triples de l'*Herbier de l'Ile de Cuba*.
4. *Herbier d'Abyssinie*, plantes récoltées par les Drs. R. G. Dillon et A. Petit, ayant servi à la publication de la Flore d'Abyssinie, par A. Richard. 7812 espèces environ, un grand nombre d'échantillons.
5. *Herbier de Sénégambie*, plantes récoltées par MM. Heudelot et Leprieur, plantes ayant servi à la publication de la Flore de Sénégambie, par A. Richard. 900 plantes environ.
6. *Herbier de la Guyanne Française et des Petites Antilles*, plantes récoltées par Louis Claude Richard, accompagnées de dessins, analyses, etc., faits par L. C. Richard. 2664 espèces environ, un très grand nombre d'échantillons.
7. Plantes de la Guyanne Française de M. Leprieur, 744 espèces.
8. Plantes du Brésil, provinces de Rio-Janeiro, Minas-Geraes, St. Paul, plantes récoltées par M. Ch. Vauthier. 4050 espèces environ.
9. Plantes de la Nouvelle-Zélande, du voyage de 'l'Astrolabe' de M. Dumont-D'Urville, ayant servi à la publication des plantes de la Nouvelle-Zélande, par A. Richard.
10. Herbier des environs de Paris, 12 cartons. Cryptogames, 37 cartons.

Plantes françaises, 600 espèces environ. Plantes de Naples et de Sicile, 600 espèces environ. Plantes de Chine. Plantes de Bourbon et de Madagascar, 600 espèces environ. Algues marines, un gros paquet.

Plantes des Indes. Plantes du Cap de Bonne-Espérance, Acacias et Proteaceæ de la Nouvelle-Hollande.

Nota.—Les plantes de l'Amérique du Nord, de *Michaux*, publiées par *L. C. Richard*, font partie de *l'Herbier-général*.

NOTICES OF BOOKS.

GÉOGRAPHIE BOTANIQUE RAISONNÉE, ou *Exposition des Faits principaux et des Lois concernant la Distribution Géographique des Plantes de l'époque actuelle*; par M. ALPH. DE CANDOLLE, etc. 2 vols. 8vo. Paris.

(Continued from p. 64.)

The second volume of M. de Candolle's Work opens with a continuation of the Second Book, which is devoted to Geographical Botany, as contradistinguished from Botanical Geography, and with Chapter 8, which is devoted to the changes that affect the localities inhabited by species, or in other words, that affect the distribution of species. The subject of Naturalization here holds a prominent place, and M. de Candolle commences with defining the term as he understands it. A species he considers to be completely naturalized which is found to be, to all appearance, in the same relative conditions as the indigenous species amongst which it is growing: that is to say, it grows and multiplies without the agency of man; it appears constantly; it is more or less abundant in the localities that suit it; and it has existed for many years, during some of which the climate has been exceptional. The proof therefore of a plant being naturalized must rest upon historical evidence.

On the other hand, a plant is not to be considered as naturalized, which, when introduced by the agency of man, only propagates itself by roots, without ripening its seeds, or at least spreading by means of them. To this category the *Robinia Pseudacacia*, *Rhus*, and *Ailanthus* belong, in Europe.

Many difficult questions as to what plants are to be called naturalized, arise from the complexity of the phenomena depending indirectly upon man's agency; thus many species are only known to inhabit cultivated ground, and other artificial localities, whilst another and a large

class are the parasitical *Fungi*, etc., which infest our cereals, and even our chemical infusions, etc.

The causes of transport are very fully discussed under this Chapter; the obstacles to naturalization; and the proofs or indications of a species being naturalized.

Under the same Chapter is included a very able critical article on the Naturalized Plants of Great Britain, from an examination of whose origin and limits M. de Candolle draws the following conclusions:—

1. Only about 83 species can, with any tolerable degree of certainty, be stated to have become naturalized since the eighteenth century.

2. Of these 83, 10 are North American.

3. None of the remaining 73 can be assumed to have been imported from islands, all being very widely distributed continental species: 23 are not found wild, nor even partially naturalized in those parts of the continent which are nearest to England, as Holland, Belgium, and Western France.

4. The 23 species, not found on those parts of the Continent nearest to England, must all have been introduced by man, with seeds of cereals, garden-plants, or ballast, etc.; had birds or the winds or currents transported them, they would certainly have been found in the intermediate countries.

These species are—

<i>Arabis Turrita</i> , L.	<i>Valeriana Pyrenaica</i> , L.	<i>Rumex alpinus</i> , L.
<i>Dianthus plumarius</i> , L.	<i>Nardosmia fragrans</i> , Reich.	<i>Iris tuberosa</i> , L.
<i>Silene Italica</i> , Pers.	<i>Senecio squalidus</i> , L.	„ <i>xiphioides</i> , Ehr.
<i>Astrantia major</i> , L.	<i>Petasites albus</i> , Gærtn.	<i>Crocus vernus</i> , Willd.
<i>Myrrhis odorata</i> , Scop.	<i>Hieracium aurantiacum</i> .	<i>Lilium Martagon</i> , L.
<i>Lonicera Caprifolium</i> , L.	<i>Cyclamen hederæfolium</i> .	<i>Allium Ampeloprasum</i> , L.
„ <i>Xylosteum</i> , L.	<i>Linaria purpurea</i> , Mill.	„ <i>ambiguum</i> , L.
<i>Asperula Taurina</i> , L.	<i>Acanthus mollis</i> , L.	

Of this list, 3 have spread from the Botanic Gardens of Cambridge and Oxford, namely, *Arabis Turrita*, *Lonicera Caprifolium*, and *Senecio squalidus*; and the majority of the others are plants that have been much cultivated.

5. Two species are natives of Portugal and the Azores, but are unknown in Western France, viz. *Sisymbrium polyceratium*, L., and *Alyssum maritimum*, L.; their presence however is not therefore to be attributed to the action of winds and currents; for the first is known to be an escape, and the second is a very much cultivated plant.

6. The 48 remaining species are divided into—those cultivated in fields, parks, and gardens (29); those easily transported in ballast, or mixed with other seeds (9); and those that are not to be accounted for by culture or facility of transport: the list of these latter we shall cite, as they give rise to much curious speculation:—

Geranium Pyrenaicum, <i>L.</i>	Datura Stramonium, <i>L.</i>	Veronica Buxbaumii, <i>Ten.</i>
Sedum dasyphyllum, <i>L.</i>	Scrophularia vernalis, <i>L.</i>	Lamium maculatum, <i>L.</i>
„ album, <i>L.</i>	Linaria supina, <i>Desf.</i>	Euphorbia Cyparissias, <i>L.</i>
Pyrethrum Parthenium, <i>L.</i>		

7. Of the whole 70, only one remains, whose existence is very anomalous, the *Ononis reclinata*: this may have been conveyed by currents or birds, but M. de Candolle inclines to the supposition that it was more probably introduced by man.

8. The 10 North American species are all garden-plants, or otherwise certainly introduced by man's agency.

9. The majority of the naturalized plants inhabit the South of England.

10. Of the 83 species, 19 are annual, 8 biennial, 52 have perennial roots only, and 4 are woody-stemmed.

11. The Dicotyledons bear a greater proportion to the Monocotyledons amongst the naturalized than they do amongst the indigenous species.

12. The proportion of species with a pappose seed is very small.

13. One aquatic alone is included in the list (*Anacharis Alsinastrum*).

14. The absence of saline plants is most remarkable.

15. There is but one Leguminous plant; though the seeds of that Order are so easily preserved, and so many species grow in the parts of the Continent very near to England.

16. The greater number are found on old walls or in very artificial localities.

17. The number of naturalized species has been increased by 55 since the publication of Ray's 'Synopsis,' by Dillenius, in 1724; of this number, 19 have been introduced since the year 1800.

18. Within the last 3000 years it appears that, while man has been directly instrumental in introducing species, it is very doubtful if the winds, currents, or birds have imported one during that long period; certain it is, that these causes have introduced no alpine, aquatic, or woody plant.

A long and extremely interesting article is devoted to the naturalization of plants imported from great distances into different parts of the world, as Europe, the United States, India, etc.; but it is impossible, within our limits, to go into this. With regard to the tropical and subtropical species especially, the limits of the species are often so disputed, that the data upon which the arguments are founded have a different value in the opinions of different naturalists; for that special knowledge of all the conditions, physical and others, under which the plants are found in countries with which the author is not intimately acquainted, being necessarily wanting, he is obliged to rely upon sources of information of extremely different value. That some of our own best local botanists differ as to the indigenous or exotic origin of many of our common English plants, is notorious; but the wrong conclusions that must arise from this source of inevitable error, are, thanks to M. de Candolle's greater general acquaintance with European botany and with the physical features of Europe and its flora, considerably reduced. The lists given, and the discussions that accompany them, are however of the greatest value, not only from the immense amount of valuable information brought together, but from the skilful manner in which they are arranged for analysis. Upon such a subject, an author can, in the present state of knowledge, be a pioneer only, and as such, M. de Candolle has here done his duty admirably.

Under the discussion upon tropical plants which are common to Asia, Africa, and America, and have probably been transported from one of these countries to the others, a list of the principal ones are given, which, as being of great value, we here quote.

1. *Tropical Species, now common to Asia, Africa, and America, but probably transported from the Old World to the New, or from the New to the Old.*

Argemone Mexicana, L.	Cassia occidentalis, L.	Hyptis spinigera, Lam.
? Cleome pentaphylla, DC.	„ Fistula, L.	Leucas Martinicensis, Br.
Mollugonudicaulis, B. Fenzl.	? Crotalaria incana, L.	Leonotis nepetæfolia, Br.
Urena lobata, L.	„ retusa, L.	Chenopod. ambrosioides, L.
? Sida spinosa, L.	Rhizophora Mangle, L.	Cyathula prostrata, Blume.
? „ stipulata, Cav.	Ageratum conyzoides, L.	Alternanthera sessilis, Br.
„ cordifolia, L.	Bidens pilosa, L.	Amaranthus spinosus, L.
Hibiscus esculentus, L.	Sphenoclea Pongatium, DC.	Eurulus viridis, Moq.
? „ tiliaceus, L.	Scevola Lobelia, L.	„ caudatus, Moq.
Zornia diphylla.	Hyptis pectinata, Poit.	? Achyranthes fruticosa, Lam.
„ var. glochidiata, Benth.	„ brevipes, Poit.	? „ aspera, L.

- ? *Achyranthes argentea*, var. *Vinea rosea*, *L.* ? *Canavalia obtusifolia*.
 ,, *δ, virgata*, *Moq.* *Ipomœa Pes-capræ*, *Br.* *Clitoria Ternatea*, *L.*
 ? *Desmodium triflorum*, *DC.* ? ,, *tuberculata*, *R. et Sol.* ? *Phyllanthus Niruri*, *L.*
Abrus precatorius, *L.* ? *Batatas pentaphylla*, *Choisy?* ? *Eleusine Indica*, *Gærtn.*
Parkinsonia aculeata, *L.* ? ,, *paniculata*, *Choisy.* ? *Dactyloctenium mucrona-*
Acacia Farnesiana, *Willd.* *Heliophytum Indicum*, *DC.* *tum*, *Willd.*
Guilandina Bonduc, *L.* *Physalis angulata*. *Cenchrus echinatus*, *L.*

2. *Species probably transported from Africa to America, or vice versâ, but which are not found in Asia or Australia.*

- ? *Sida rhombifolia*, *L.* *Bidens leucantha*, *Willd.* *Alternanthera* · *Achyrantha*,
 ? *Urena Americana*, *L.* ? *Schwenkia Americana*, *L.* *Br.*
Triumfetta Lappula, *L.* ? *Capraria biflora*, *L.* *Iresine vermicularis*, *Moq.*
 ,, *rhomboidea*, *Jacq.* *Chrysobalanus Icaco*, *L.* ,, *aggregata*, *Moq.*
Drepanocarpus lunatus, *Mey.* ? *Hyptis atrorubens*, *Poit.* *Boerhaavia paniculata*, *Rich.*
Ecastaphyll. Brownei, *Pers.* ? ,, *obtusifolia*, *Br.* *Commelyna agraria*, *Kunth.*
Mucuna urens, *DC.* ? *Chenopodium foetidum*, *Remirea maritima*, *Aubl.*
Schranckia leptocarpa, *DC.* *Schrad.* ? *Sporobolus Virginicus*, *Kth.*
Mimosa asperata, *L.* *Telanthera frutescens*, *Moq.* ? *Stenotaphrum America-*
Desmodium incanum, *DC.* ,, *maritima*, *Moq.*, *num*, *Schrank.*
 ,, *tortuosum*, *DC.* ,, *var. α.* *Poa ciliaris*, *L.*
Cassia obtusifolia, *L.*

3. *Tropical Species, now common to America and Asia, or to the Islands of the Pacific, and probably transported thither.*

- Tribulus cistoides*, *L.* *Quamoclit vulgaris*, *Choisy.* *Gomphrena globosa*, *L.*
Tephrosia piscatoria, *Pers.* *Hyptis capitata*, *Jacq.* *Pisonia aculeata*, *L.*
Poinciana pulcherrima, *L.* ,, *spicata*, *Poit.* *Mirabilis Jalapa*, *L.*
Asclepias Curassavica, *L.* ,, *suavolens*, *Poit.* ,, *dichotoma*, *L.*
 ? *Ipomœa Pes-tigridis*, *L.*

The following are the conclusions derived from the above, and other facts of the same kind, cited by the author:—

1. The Old World has received more species from the New than *vice versâ*. This appears to be owing to the easterly direction of the great currents between America and Africa, and between Africa and India.

2. The total number of species thus transported is absolutely insignificant, compared with the whole extent of the tropical Floras.

3. The majority of naturalized species appear to have been transported by man, there not being more than 15 or 20 species that can have been transported by currents. The result indicates that the disjunction of the Old World from the New preceded the creation of the

existing species, and further, that since the creation of the latter no intermediate large islands or archipelagos have existed.

4. The most active transport has been between the opposite coasts of America and Africa, and is due to the currents and the slave-trade.

5. The agency of man has hitherto been rather involuntary than voluntary.

6. The majority of the species are such as are easily propagated.

7. The species are very frequently littoral, or affect cultivated or artificial localities.

8. Certain families are very largely represented in the list; they are *Malvaceæ*, *Tiliaceæ*, *Leguminosæ*, *Convolvulaceæ*, *Labiataæ*, *Amarantaceæ*, and *Nyctagineæ*. Of these, the *Malvaceæ*, *Leguminosæ*, and *Convolvulaceæ*, have seeds capable of retaining their vitality during long exposure to immersion; others have seeds adapted to cling to foreign bodies, as *Tiliaceæ*, *Labiataæ*, and *Nyctagineæ*.

9. Most of the species are annual or woody.

A very curious description is given on the subject of plants which might be expected to have become naturalized, but which are not so, or, as M. de Candolle entitles it, "Exemples de Naturalisation manqués."

The difficulty of naturalizing plants at all is here forcibly dwelt upon, and the extremely small proportion of the many thousand species that have been introduced into our gardens, which eventually propagate themselves beyond those limits. Of a vast number which have been tried at the Bois de Boulogne, the *Potentilla Pennsylvanica* is the only one which is positively known to have established itself. In the neighbourhood of Geneva, one of M. de Candolle's friends has been in the habit during the last eighteen years of annually scattering many hundreds of seeds collected in the Botanical Gardens, but hitherto without any appreciable result.

A comparison between the facility with which plants are naturalized and the extent of the areas over which they are indigenous, affords no result in the present state of our knowledge. The last section of this Chapter is devoted to the contraction of the area occupied by a species. Artificial causes of course operate largely in diminishing the number of individuals, and hence of the area occupied by a species, and of these the most important are the draining of marshes and the cutting down of forests.

The data for facts of this class are necessarily rare, and are chiefly

negative; the best positive evidences of disappearance are the existence in peat-bogs, etc., of the remains of species not now inhabiting a country. Of these M. de Candolle mentions the cones of *Pinus Mughus* now found in the bogs of Ireland, of *Pinus Picea* and *Corylus Avellana* in the Shetland, and of *Betula alba* in the Faroe Islands.*

(To be continued.)

SEEMANN, DR. BERTHOLD: *Popular History of the PALMS and their Allies, containing a familiar account of their structure, geographical and geological distribution, History, Properties, and Uses, and a complete list of all the Species introduced into our Gardens.* Royal 16mo. With coloured Plates. London, 1855.

This is another contribution to Mr. Lovell Reeve's "Popular Series of Scientific Works;" and this particular subject could not have been put into better hands than those of Dr. Seemann, who may be said to have spent a great part of his life among Palms. As a school-boy ("one of fifty unruly ones, who needed a cane to keep them in order"), his first botanical lesson was derived from a Palm of the cane or rattan kind. These implements of punishment were abstracted from the master's custody whenever an opportunity offered, cut up into lengths by these young gentlemen, and used for smoking instead of cigars; but the stock in hand increased in the school-room, and some pupils, more curious than the rest, were induced to inquire where they came from, and of what plant they were the product. A Cyclopædia supplied the needful information, viz. that these canes were the stems of a slender East Indian Palm, a *Calamus*, and much used for making chairs and walking-sticks. At a more advanced period our author studied Palms in the hothouses of Germany, of Kew, and, latterly, on a more extended scale in the tropics of Asia and America.

The general plan of the work is similar to that of 'The Palm-trees of the Amazon, and their Uses,' by Wallace, noticed in our Journal, vol. vi. p. 61; but it is of course on a more extended scale, and confined to no particular region of the globe. But we do marvel to find that

* To which may be added, as more local examples, the Yews and Oaks found imbedded in the fens of Cambridgeshire, and a peculiar form of *Polyporus fomentarius* found on the Oak, of which a notice, by the Rev. M. J. Berkeley, has been read before the Linnean Society of London (in February, 1856).—ED.

though Dr. Seemann is, by habit and education, as proved by his publications, a man of science, and though his book professes to be a "scientific work,"* the genera are all *alphabetically* arranged, whilst Mr. Wallace, who makes no pretensions to botanical science, has arranged all the genera and species in the order adopted by Dr. Martius in his learned and elaborate work on the Palms. But this is not all, for the *figures* of the Palms are also attempted to be arranged alphabetically; and there might have been some reason for this, as it might be supposed the object was to have the plates located opposite or near to the respective descriptions; *Acrocomia Mexicana*, for example, amongst the descriptions of *Acrocomia*: but no such thing; the plate of *Arenga* is the only genus beginning with A that is ranked under that letter, and that is not placed opposite to the description of *Arenga*. Figures of *Cocos* and *Copernicia* come among *Borassus*. The plate of *Phytelephas* comes amongst *Phoenix*, but no other whatsoever of the twenty plates is in juxtaposition with its respective initial letter: not one in the whole book with its respective genus. This, too, is the more tantalizing, because, though the plates are numbered, we find *no reference* to the plate under the descriptions. There is indeed a list of plates enumerated after the preface, though, being alphabetical like the plates, its use is not easily divined. Even the alphabetical arrangement must be taken with some allowance, for the plates, being mostly copied (with acknowledgment) from Martius, there are in several instances two different genera on one plate, a plan justifiable perhaps in the case of the very costly figures of the original work, but scarcely required here. And then, in this list of plates, we find *Nipa*, not under the letter N (though it is so in the description), but under A, immediately following *Arenga saccharifera*.

In regard to the plates themselves, the author, in his characteristics of the Family, dwells on "the dark green foliage of the waving Palms;" and Martius, from whom these figures are taken, represents, faithfully, the *bright green* of the majority of Palms; but that is a colour which seems wholly eschewed in this book; a scorching brown characterizes everything in the trees and landscape, save the dabs of blue for sky and water, so that we are sure Martius would not acknow-

* "It is not a purely literary production, but a *scientific work*, which, to meet the views of my publisher, has assumed a popular garb, in which mere literary considerations have been made subordinate to scientific accuracy."—*Preface*, p. xiv.

ledge them as imitations of his costly plates; and this ochraceous brown colouring is carried to such an extent in the frontispiece, representing the *interior of the Palm-house of Kew*, that it has called forth the just criticism in the 'Gardeners' Chronicle,' "If it were really like truth, the Palm-house must be a furnace in which nothing living could exist." The *outline* figures of Wallace are infinitely to be preferred to these; and Wallace has, besides, given some good figures and representations of spathas, spadices, and fruits, so that a tyro may form some notion of the inflorescence, of the flowering and fruiting of these "Princes of the Vegetable Kingdom." We are quite sure that the work would not be less popular if the faults we have noticed were corrected, and we are equally sure it would be more useful: it would lead the uninitiated to take greater delight in the wonders of the vegetable creation, and to a desire for a higher degree of scientific knowledge. We trust that what we have been led to complain of is not occasioned by a desire "to meet the wishes of the publisher." Certainly the publisher is no gainer, and we know, from Dr. Seemann's previous botanical writings, and the plates and analyses that accompany them (see, for example, the 'Botany of the Voyage of H.M.S. Herald'), that he is as willing as he is capable of making all needful corrections in a future edition: *Verbum sat*.

Taking, then, the most important part of the work, that which appeals to the mind rather than to the eye, it is deserving of great praise;—the descriptive part popular and not unscientific. The volume is dedicated to Humboldt, whose highly complimentary letter to the author on the occasion is given in the Preface. After a well-written Introduction, giving a general account of the Palms, our author has an essay on the geological and geographical distribution of Palms. The rest of the work is devoted (300 pages) to a "detailed History of Palms" from A to Z,—from *Acrocomia* to *Zalacca*,—the respective species under their proper genera in alphabetical order, not indeed of every Palm, but of those best worth knowing from their uses or curious structure and history, or from the fact of their being in cultivation in European gardens, and in that case accessible for inspection to those who are never likely to see a Palm in its native locality. Seemann estimates the number of known Palms at about 600 species; those in cultivation in our stoves about half that number. The former calculation is perhaps as much too low as the latter is too high. The almost

impossibility of preserving the gigantic leaves, flowers, and fruits, for the herbarium or museum and home study, the few scientific travellers that can describe them *in loco natali*, and the difficulties that even such have to contend with in procuring samples* and in the study of them, must greatly retard the progress of our knowledge of them; while, with regard to the enumeration of those in cultivation, the increased and increasing rage for multiplying species, whether from a love of notoriety in the attaching an author's name to a species, or from a love of lucre in the ready disposal of a plant with a new name, little dependence can be placed on our garden *Catalogues*. The amount of information on the useful history of Palms here collected is very great, and is most creditable to the author's researches and to his own personal observations during his extensive travels. All that is curious and remarkable, all that concerns the uses and properties of Palms, is here related in an agreeable manner; and so notorious are these, that the utility of Palms has become almost a proverb, as Mr. George Herbert has it in his poem entitled "Providence:"—

"Sometimes Thou dost divide Thy gifts to man,
Sometimes unite. The *Indian nut* alone
Is clothing, meat and trencher, drink and cann,
Boat, cable, sail, and needle, all in one."

There is therefore no lack of interest in this subject. The account of the *Areca*, or Betel-nut; the *Arenga saccharifera*; *Attalea funifera*, which yields a vast amount of one of the so-called *Piassaba* fibres, and the nuts for handles of bell-pulls, etc., and the *Attalea Cohune*, affording Cohune-oil; the *Borassus flabelliformis*, or Palmyra Palm, second in value only perhaps to the Cocoa-nut; the *Copernicia cerifera*, or Brazilian Wax-Palm, whose trunk, beset with spiral knobs, is clothed with a natural vegetable wax; *Calamus*, yielding the Rattans; *Chamærops* (dwarf Palm), which, together with the well-known Date (*Phoenix dactylifera*), are among the few extratropical Palms; the Doum Palm of Egypt (*Hyphæne Thebaica*), remarkable for its branching stem and for its

* Humboldt especially alludes to the difficulty and almost impossibility of procuring the flowers of many species, for drawing or preservation; but Seemann ridicules any notion of difficulty, observing that the learned author has omitted to mention that some botanists have it perfectly in their power to obtain the blossoms, viz. "by climbing the trees." We should be sorry to make the attempt ourselves, or even to see Dr. Seemann climbing the trunks of the "Prickly Pole" (*Acrocomia aculeata*), and not a few others described as "clothed with spines of greater or lesser length and thickness."

gingerbread-flavoured nuts; *Elæis Guineensis*, the Oil Palm, *par excellence*; *Euterpe edulis* and *E. oleracea*, the one affording a refreshing drink, the other (together with *Oreodoxa oleracea*), the so-called *Cabbage* of the Palm; *Lodoicea Sechellarum*, the famous double Cocoa-nut; *Phytelphas*, or Vegetable Ivory, and many others, cannot fail to prove attractive to persons of all ages and both sexes, to the ignorant as well as to those already instructed in Botany. The author says, with justice, in the Preface, "I may safely affirm, without the fear of contradiction, that there is no work in existence, in any language whatever, in which an equal amount of information such as here given is to be met with."

UNITED STATES EXPLORING EXPEDITION; Vol. XVI. Botany: Cryptogamia,—FILICES, *including* HYDROPTERIDES; by WILLIAM D. BRACKENRIDGE. *Large 4to, with a folio Atlas of forty-six Plates.* Washington, U.S.A. 1854.

We have had occasion to notice the first volume, or portion, of the 'Botany of the United States Exploring Expedition' (Phanerogamia), by Dr. Asa Gray. We have now the pleasure of announcing another portion of that work, of 357 pages, devoted to the descriptions of the FERNS, accompanied by an Atlas of Plates: and this is from the pen of Mr. Brackenridge, who had the great advantage of being one of the botanists of the Expedition, and consequently of seeing the species in their native locality, and gathering them with his own hands, a privilege enjoyed by comparatively few botanical authors. Notwithstanding the difficulties under which Mr. Brackenridge laboured for want of a good botanical library at Washington,—and we may add, too, for want of an authentic herbarium for comparison of species,—he has given to the scientific world a most beautiful and highly creditable work, with carefully-compiled and not too-laboured descriptions of such species as are considered new, observations on many of the old, the whole illustrated with a great number of excellent figures, drawn and engraved by a young artist, Mr. William S. Lawrence; of whom he says, "as it was his first attempt at this kind of drawing, and, not being constantly under my supervision, there frequently occurred omissions, or but partial representations of the minor details; such as the greater or less hirsuteness of the stipes, rachis, and costa, or in respect to other

appendages." We only trust that Mr. Lawrence will persevere in this line of his art, and we should have no fear of his rapid improvement, if he do but meet with the encouragement he deserves.

The arrangement here adopted, and the greater number of the divisions and genera, are acknowledged to be in accordance with Mr. J. Smith's views, though the author does not agree with Mr. Smith in the position he has assigned to several genera and species in his system; but he pays a just compliment both to him and Dr. Presl for the light which their investigations have thrown upon a family of plants, "the genera of which had been cumbrous and unmanageable, by the accumulation of heterogeneous masses of species." We find 702 species here enumerated (of which no less than 146 are described as new), included in 107 genera. Mr. Brackenridge had foreseen where his greatest difficulty lay, viz. in a just limitation of species, an error into which those, who have had greater advantages than himself, have too frequently fallen. To avoid this error it is not only necessary to consult a great number of works, which the libraries of Washington do not possess, but to have extensive suites of specimens from various countries, and compare one with another, with an unprejudiced mind, unshackled by the views of others, and see how the varieties pass into supposed species. "Of those which are here characterized as new, some probably have already been published, either as species which I have failed to identify, or in recent works" (and there are many such,) "which were not accessible to me. I can only say that I have endeavoured to prevent, as far as possible, such an occurrence, by diligently consulting all the authorities I could command. And in the large collection of Ferns made by the Expedition, most of them on islands in the Pacific Ocean, which have not heretofore been much visited by botanical collectors, and where humidity, heat, and shade, elements conducive to the production of Ferns, are combined in a high degree, surely as large a number of new species as are here proposed was naturally to be expected." Our own investigation of Ferns from the Pacific Ocean lead to rather different conclusions, and are more in harmony with the observation towards the close of the Preface, to the effect that one and "the same Fern has frequently been met with in two or more remote parts of the globe, clearly showing that species of this Family have a more extensive geographical range than has been generally supposed."

Our author however is too candid in his observations to allow us to suppose for one moment that he has added to the number of Ferns from the vain love of species-making, or from any want of care. All his new species are characterized, and the supposed distinctions carefully noticed, and in very many cases figured also, and no dogmatical opinion is anywhere expressed: the near affinities to other species, as well as the discrepancies, are alike noticed. No doubt every botanist is free to exercise his own judgment, and different botanists may be expected to entertain different views regarding the limitation of species as of genera; but the needless multiplication of names is not only itself an inconvenience, but it renders it more and more difficult for a tyro to determine with which of these many kinds the plant he is investigating best agrees; the differences being so small, and finding it not precisely to agree with any, he considers he has another new species to add to the list.

The very first species in the book before us, *Grammitis nana* for example, we consider to be truly *G. Australis* of Brown, which now rejoices in five names. Mr. Brown's *G. Australis*, and *G. Billardieri*, Willd., were published simultaneously in Germany and in England; Mr. Colenso considered that he had found a difference in the hairiness of the plant, and called it *G. ciliata*; Bory published it under the name of *G. scolopendrina*; but Dr. Hooker has shown that this little Fern has a wide geographical range. Specimens in our Herbarium prove it to be a native of Tasmania, Australia, Lord Auckland's and Campbell's Islands, New Zealand, Fuegia, Peru, the Sandwich and Falkland Islands, and Tristan d'Acunha.

Two new genera are proposed, one *Diellia* (comprising three species of the Sandwich Islands), "which differs from *Schizoloma* principally in the interrupted sori; in this respect it has a considerable affinity with *Synaphlebium*, but in that genus the costa is excentric or wanting." The two kinds figured are handsome plants, but surely very closely allied specifically; the third species (not figured) "is very distinct in character from the two others:" the plants are unknown to us. The second genus is *Dichlidopteris*, "which has the habit of *Moenogramme*, but no lateral veins or indusium. Its nearest affinity is to *Blechnum*, from which it differs in habit, venation, and the thick, scarcely altered indusium; the fronds being so narrow that the sporangia of the two sori become confluent." Perhaps, in regard to the

two sori, Mr. Brackenridge has been misled by the artist, who has represented sporangia as arising from a filiform receptacle in the axis of the supposed indusia, at a distance from the costa; hence his character:—" *Venæ simplices, rectæ, liberæ, intramarginales, nempe unica inter costam subtus prominentem et margines frondis angusto-linearis æquidistans, receptaculum sporangiferum continuum efformans.*" This we apprehend to be an error: and the supposed double or two-valved indusium, described by Mr. Brackenridge, he will find distinctly represented in one of the earliest figures of *Monogramme*, namely, *M. linearifolia*, Desv. Journ. Bot. 1813. vol. i. p. 22. tab. 2. f. 2 (*Pleurogramme immersa*, Fée), and thus described, "La fructification est recouverte par deux membranes qui se touchent vers la partie moyenne de la ligne, et s'ouvrent de dedans en dehors. Lorsque ces membranes sont ouvertes, la ligne formée par les capsules semble être cachée dans l'épaisseur de la feuille." In other words, the sorus is, in its younger state, sunk between the somewhat projecting margin of the adjacent portion of the frond, as in several nudisorous Ferns, for example *Antrophyum* (see Hook. Gen. Fil. tab. CIX. A. f. 3, and *Teniopteris*, Hook. l. c. tab. LXXVI. B. f. 3). In a more advanced state these raised edges are concealed by the spreading of the sporangia; hence Fée, "Les deux côtés de la lame se creusent dans la *Pleurogramme immersa*, pour recevoir les sporanges, et le mésoneure qui fait office de réceptacle s'épaissit légèrement au point fructifère."—The plant is a true *Pleurogramme* of Presl.

JAUBERT et SPACH: ILLUSTRATIONES PLANTARUM ORIENTALIU;
ou, *Choix de Plantes Nouvelles et peu connues de l'Asie Occidentale.*
Imp. 4to. Paris. Fasc. 44-47.

In the first of these fasciculi just mentioned, next after *Oliveria decumbens*, Vent., five rare oriental *Cruciferae* are described, and figured from the drawings of the celebrated "*Vélins*" of the Museum of the Jardin des Plantes; viz. *Vesicaria Cretica*, Poir., *Crambe orientalis*, L., *Erucaria microcarpa*, Boiss., *Raphanus lyratus*, Försk., and *Didesmus Ægyptius*, Desv., var. *pinnata*. Tab. 437 represents *Swertia decumbens*; 438, *Primula verticillata*, Försk.; 439, *Primula Boveana*, Dcne.; and 440, *Primula Simensis*, Hochst.; 441, *Polygonatum orientale*, Desf.; 442, *Allium Neapolitanum*, Cyr; 443, *Chionodoxa Cretica*, Boiss. et Heldr.; 444, *Mal-*

vella Sherardiana, Jaub. et Spach; 445, *Physoleucus pachystachya*, Jaub. et Spach; 446, *Anarrhinum Arabicum*, Jaub. et Spach; 447, 448, and 449, *A. Abyssinicum*, Jaub. et Spach; 450, *A. orientale*, Jaub. et Spach; (Fasc. 46 has by some accident not been received by us;) 461, *Eremostachys macrophylla*, Montbr. et Auch.; 462, *E. pyramidalis*, Jaub. et Spach; 463, *Euphorbia cuneata*, Vahl; 464, *E. Perrotetii*, Jaub. et Spach; 465 and 466, *Cluytia myricoides*, Jaub. et Spach; 467, *C. lanceolata*, Försk.; 468, *C. Abyssinica*, Jaub. et Spach; 469, *Erodium glaucophyllum*, Ait.; 470, *Rheum Ribes*, L.

DOZY, F., et J. H. MOLKENBOER: BRYOLOGIA JAVANICA. 4to. Fasc. VI., VII., each with five Plates. Leyden. 1855.

We are glad to find that the death of Dr. Molkenboer (whose name still continues on the cover) does not interrupt, or at any rate interrupts but temporarily, the progress of this valuable work, and that the Government has taken measures for its support. The figures, as is well known, are very full and satisfactory, after the model of those of Bruch and Schimper, and there can be no better. Fasciculus VI. contains a fine new *Diphyscium*, *D. mucronifolium*, Mitten, *Racolopus pilifer*, *Oligotrichum Javanicum*, *Pogonatum microphyllum*, *P. clavatum*, all new species of Dozy and Molkenboer. Fasciculus VII. is devoted to five plates of *Polygonatum*, viz. *P. Junghunianum*, *P. Teysmannianum*, *P. Teysmannianum*, β . *tortile*, *P. macrophyllum* (all new species of Dozy and Molkenboer), and *P. cirrhatum*, Sw.

DE VRIESE, DR. W. H.: *De KINA-BOOM uit Zuid-Amerika overgebracht naar Java*, onder de regering van Konig Willem III. 'S Gravenhage. 1855.

This pamphlet of 122 pages, in the Dutch language, gives an account of the successful introduction of the true or best medicinal bark (*Cinchona Calisaya*) into Java. Thanks to the kind offer of a Lady of the author's family, we shall be able shortly to give some interesting extracts in an English dress.



Notes on the VEGETATION of the Middle Island of NEW ZEALAND, chiefly in the neighbourhood of Nelson, extracted from Letters written to the Editor by DR. DAVID MONRO, of Nelson.

Two or three times in the course of the year I make a journey from this place (the Waimea), where I reside, to the Wairau, nearly one hundred miles distant by the bridle-path, though probably not above thirty in a straight line. For about forty miles I proceed in a southerly direction over a country of comparatively low level, though of very uneven surface, composed of ridges divided by steep and narrow valleys, and uniformly covered with moderately high Fern. In proceeding across this country we are, generally speaking, obliged to keep the summit of a ridge and follow it in its different windings. The vegetation in this tract of country is poor and very little varied: in the bottoms of the valleys and about the brooks* there is some variety of shrubs, but the hills are possessed by Fern to the exclusion of almost everything else. A small species of *Phormium** grows upon the ridges here, part of the flower of which, I forget now whether the calyx or corolla, is green, and not dark red as in the larger variety. Another plant is very common, which from a bunch of sword-shaped leaves sends up a stalk about a foot high, bearing a white daisy-like flower about the size of a crown-piece: the native name of this plant is "Toocumé."† From the under surface of the leaf a cuticle strips off which has a strong resemblance to fine white kid-leather. This the natives of the South twist into yarn, making fishing-lines of it; and I have also seen this yarn woven into a soft and warm cloth, with which an excellent pair of leggings was made. A few shrubs are also met with about these ridges, some of them showy when in flower, but as my friend Mr. Bidwill has been over the ground, it is not likely that I shall find much that is new. Having travelled about forty miles in a southerly direction, I enter the Wairau Pass: this is a deep cleft in the mountain-chain which has been on my left, and which, interrupted only by this pass, continues its southerly bearing and joins the alpine ridges about the lakes Rotuiti and Rotueva, upon which the snow never melts. The pass is ten miles through and wooded from end to end. The trees are uniformly what the colonists call Black Birch‡ (Beeches,

* *P. tenax*, var. β , Banks et Sol. † Probably *Celmisia coriacea*, H.f.

‡ *Fagus fusca*, H.f.

I believe). The ground is covered with soft green Moss, and there is very little underbrush. In this wood about midsummer the beautiful epiphyte (a *Loranthus*, probably) is to be seen in flower in abundance. Having passed through this wood we emerged into the valley of the Wairau at a height of perhaps nearly 2000 feet above the level of the sea. The valley here consists principally of large stones, and the vegetation is very poor. About the river however and on the islands enclosed between its branches there is a considerable variety of shrubs, and many of them, I conceive, unknown; at least they are new to me. Of these I shall endeavour, upon my next journey to the Wairau, to get as many specimens as I can. The remainder of my journey is down a grassy valley, upon which nothing grows but grass, with here and there a plant of Anise,* or that vegetable porcupine which the colonists term Spear-grass.† On the banks of some of the streams which flow into the Wairau, a shrub is met with as yet I believe undescribed: I enclose you a few of the seeds, of which I happen to have some by me. It is an addition to a natural family which is very sparingly represented in this country—the *Leguminosæ*. The shrub grows to the height of eight or ten feet, and is in outward appearance almost exactly like what we call here the Spanish Broom [*Carmichaelia*]; but the flower is pink, small, and in clusters: when in full flower, about the month of December, it is very handsome. There is another shrub in the Wairau very common on dry rocky places, with a large white *Composite* flower, which I believe is undescribed. The leaf is about the size of the Laurel, of a pale glossy green, and thick; the under surface and the leaf-stalk are almost exactly like white cotton-velvet: I shall easily be able to get specimens of this.

I have made an excursion to the Rotuiti Lake, which lies about fifty miles to the southward of Nelson, but found very little there which seemed new to me or likely to be of interest to you. On my way back I was more fortunate. I ascended to the summit of the lofty range which divides the valley of the Waimea and Wairau, and from a mountain-top there, called Gordon's Nob, which is probably between 4000 and 5000 feet high, I gathered some plants which may be considered as alpine in this country, and which I trust may be new to you. I have not aimed, in sending you specimens, at presenting you with an epitome of the Flora of this district. The majority of the plants I have

* A species of *Anisotome*, H.f.

† *Aciphylla squarrosa*, Forst.

sent will probably be already known to you. In picking up specimens I was chiefly guided by their being found at some distance from the seashore, and therefore, as I imagined, having less chance of being known to botanists than the vegetation of the low levels already explored by French naturalists and others. The collection I have sent you does not however include all that I could have wished or that I know of. There are several other shrubs and herbaceous plants that I shall endeavour to procure upon a future occasion, which I have reason to believe are still nondescript. As the country becomes better known and more opened up, the facilities of obtaining plants will be very much extended. Only last summer our pioneering sheepowners have pushed forward into a very elevated district,—the Fairfield Downs, which lies near the sources of the River Awatena, between the Port Cooper plains and Cape Campbell. In this district it will not be difficult to attain an elevation of 7000 feet, or thereabouts, above the sea: at this height you are in a country where snow in patches lies nearly throughout the year. I intend visiting this district next summer, and both from what I have heard from casual visitors of the place, and from the climate which it must enjoy, I feel sanguine that I shall find some things there which will possess considerable interest for you. I regret extremely, when on these expeditions, the very limited amount of my botanical knowledge.

You inquire about the trees in this district,—which are the highest, and other questions. Our loftiest and largest tree here is what the sawyers call White Pine; the natives, Kahikatea: it is a *Podocarpus*,* I believe. Trunks are not unfrequently four or five feet in diameter, and rise to a great height. This tree and the Pukatea, a gigantic Myrtle, indicate the very richest soils in the country,—deep alluvial soils, generally rather wet. On the drier alluvial soils the largest trees are the Mai,† the Red Pine of the sawyers, and the Totara,‡ a species of Yew. This last is a very picturesque tree, its branches twisting somewhat like the Oak, and growing to a great size: it splits with great freedom, and is, in consequence, the wood most in demand for fencing, laths, and shingles: it is also very durable in the ground, and is the tree of which the natives generally make their canoes. Both the Totara and the Mai grow, by preference, on rather gravelly soils. Another large forest-tree is the “Rimu,” *Dacrydium cupressinum*. This also grows

* *P. dacrydioides*, A. Rich. † *P. spicata*, Br. ‡ *P. Totara*, A. C.

upon rather inferior soils, and ascends to a higher level than the Pines. Young specimens of this are very pretty, but the old tree has a very mournful funeral appearance: it is sawn up into timber, along with the trees I have mentioned before; but the timber, though rather ornamental, is not much esteemed. These are the only timber-trees of this district: they are the largest trees, and constitute the largest portion of the forest, upon the low grounds. - Interspersed among them are smaller trees, the Titoki, the Miro,* the Taua,† and others. As you ascend to the higher levels these trees begin to be mixed up with an increasing proportion of what we call the Birches (Beeches), and at an elevation of say 1500 feet, the forest which clothes the hill-sides is entirely composed of these or nearly so. On the way to the Wairau, at the highest part of the road, we pass through a forest ten miles long: there is but one Pine to be seen in this from one end to the other, and, with the exception of here and there a *Fuchsia*, an *Aristotelia*, and a few other straggling undershrubs, the entire vegetation consists of these Beeches. That there are several species of them I am well satisfied, but how many I am altogether unable to say. I have fancied that the leaf changes its character according to the age of the tree; for under one of the trees, I have found a great number of seedlings, with leaves very different from that of the overshadowing tree, from which it was reasonable to suppose that they were derived: I have very little doubt that some species of them would thrive in the open air in England. On Gordon's Nob I met with them at an elevation of about 4000 feet, but quite dwarfs, bent with the wind and hung with Lichens: this was the kind with the smallest leaf. It is not very common to meet with the seed, but I have seen it: it is a triangular nut, very much like Beech-mast, but much smaller. Some of the Alpine Veronicas would also, I have very little doubt, succeed in the open air in England: these are exceedingly pretty little plants. In the manner of their growth and the arrangement of their leaves and flowers, they are very symmetrical. One of them, which I sent to you, I found in flower on the 1st of October, at an elevation of about 2000 feet, where it must have been exposed even at that period of the year to occasional sharp frosts.

The botany of the eastern and western sides of this island will be found, I fancy, to differ very much. The great primitive range of the

* *Podocarpus ferruginea*, Don.

† *Nesodaphne Tmoa*, H.f.

island runs down its western side: the highest mountains are here,—the oldest, geologically speaking,—granites, porphyries, crystalline limestones. These form a stupendous mountain-chain, capped with perpetual snow, which catches the westerly wind sweeping across the Southern Ocean, and causes a precipitation of the moisture with which it is charged. The west coast is accordingly extremely humid: this is the character of the country which lies to the west of Blind Bay. On the eastern side of Blind Bay we have a different country,—different, geologically speaking, and different in point of climate. The mountain-range which bounds the Waimea to the east and runs inland towards the sources of the Wairau River, consists of schistose rocks and slates, broken through however in several places by dykes and masses of igneous rocks, hornblende, and basalt. The mountain from which I got many of the plants I sent to you, Gordon's Nob, consists of roofing-slate, set nearly upon its edge. Its summit is almost destitute of vegetation; the vertical strata cropping up through large fields of slate-fragments of all sizes, upon which almost the only thing growing was the *Euphrasia*,* with here and there a dense globular patch of the *Raoulia*, studded over with its starry white flowers. I found here also the Cruciferous plant which you mention as new, and remark as an only specimen.† I looked anxiously for another, but it was the only one I could find.

The mountain-range east of the Waimea is divided by the long valley of the Wairau, from another range to the east of that valley, of a more recent geological character: the rocks of which it consists are sandstones, conglomerates, and non-crystalline limestones; and, as showing the connection between soil and the character of the vegetation, while on the west of the Wairau River the mountains bounding the valley are clothed with Fern and Forest, and offer no pasture, those on the eastern side, to which I have just referred, are almost uniformly grassy; this may in fact be said to be the northern limit of the grassy country which stretches down along the eastern coast of the Middle Island as far as Foveaux Straits. This country, though the hilly portion of it is extremely rugged, is nevertheless traversable, the vegetation opposing very little impediment to moving about; but in most other parts of New Zealand locomotion is a very serious matter whenever you leave a beaten path; for not only are the hill-sides very steep

* *E. cuneata*, Forst. ?

† *Thlaspi* ? *australe*, H.f.

and much broken up, but the ordinary Fern which clothes them is so high and unyielding as to oppose an almost insurmountable obstacle. It is not more than about fifteen miles in a direct line from my house in the Waimea to the Wairau valley, but the difficulty of crossing the mountain-range, from the causes adverted to, is so great, that the persons who have accomplished it have had four days of most laborious work, and every one bound for the Wairau goes round a distance of about seventy miles rather than face these fifteen miles over the mountains. I will take notice of what you say about seeds of trees and shrubs, and will endeavour to send you some. I shall particularly endeavour to get some of the seed of the Beeches which are found at the highest levels; they are, when well grown, very handsome trees, and would be a great addition to an English arboretum. I sent you in a letter, two years ago, the seed of the large *Carmichaelia*, but I presume it had lost its vitality by the time it reached you. I raised some young plants in my garden here, and I observed that they showed at first true leaves, small and set at considerable distances along the stem, but either the soil or the situation did not suit them, and they died off.

Gardening in this climate would be very satisfactory if we only could get labour; but we cannot, and therein is the great grievance of every New Zealand capitalist at present. Wages are high, but the farmers would not object to pay the wages if they could get hands. In the Blind Bay district we have as much sun perhaps as in any part of New Zealand. The summer temperature is not high, the thermometer seldom passing 80° , the temperature reduced by an almost constant breeze from either the sea or the land; and yet judged by its results in ripening fruits, the climate should be almost equivalent to the south of France, where the temperature is sometimes for weeks together between 90° and 100° . We have Peaches, of very good quality, upon standards in great abundance. Figs of excellent quality; and grapes upon a wall ripen perfectly, or in any sheltered situations where the sweep of the breeze is broken. Melons ripen well without any artificial heat. Pomegranates do not ripen; and I have not heard of any one yet trying the Orange, but it is unlikely that any but the hardiest sorts would ripen, and those only against a wall.

Extracts from Two Letters from the Rev. CHARLES PARISH, of Moulmein, to Dr. T. THOMSON, Director of the East India Company's Botanic Garden, Calcutta.

Moulmein, July 30, 1855.

Without much pretension to a knowledge of botany, I am passionately fond of this study, and therefore gladly answer your kind communication and offer of correspondence. You ask about the mountain called Moolee-it, and its productions and elevation, etc. I did not myself ascend it; but, in January last, the Deputy Commissioner of this district invited me to join him in a tour in the neighbourhood; as he is an enthusiastic ornithologist, I thought that our pursuits were of a kindred nature, and gladly availed myself of the proposal.

We went up to the head of one of the four rivers, which unite their waters at Moulmein, the Gyeen, bearing away to the north-east, towards a fine range of mountains, clearly visible on a fair day from this place. After leaving our boats, it took us however three days to reach the foot of them! By this time I was reluctantly obliged to retrace my way alone, as my duties would not allow of a longer absence. We guessed the height of the range to be 6000 feet. Captain Tickell, the Deputy Commissioner, was not desirous of climbing those mountains alone, so he came back, and then pursued an easterly course up another river, the Honarees, and it was in that direction, due east of Moulmein, that he came to the mountain called Moolee-it, which he ascended, and, by the boiling-water test, ascertained its elevation to be 7000 feet. He tells me that he sent his calculations to Captain Thuiller, at Calcutta, for correction; so that you can easily satisfy yourself on this point. Captain Tickell is not a botanist, but he kindly complied with my request that he would bring me Ferns, or other remarkable plants, and I send you some small Ferns which he gathered at random, on a height of between 5000 and 6000 feet; also some interesting Mosses, especially beautiful specimens of *Schlotheimia sulcata*, in fructification. Was it ever found before in that state? The mountain, so far as I can gather from Captain Tickell's description, is clothed with dense jungle to within five hundred feet of the top, where there is a small terrace, just below the loftiest rocky peak, of grass-land, open, and resembling an English heath or moor, with the additional similitude of partridges running about in great numbers among the abundant Fern, which

latter is a *Pteris*, very like our common Brake, *P. aquilina*. Captain Tickell brought down specimens of it; also of what he calls a *Rhododendron*, which he describes as a beautiful shrub, in full flower. He kindly made a sketch of it; but, as the details are not botanically accurate, I cannot decide this point, but hope to do so, if I can succeed in preserving a growing plant of it, which however looks very poorly. The leaves resemble those of a *Rhododendron*. There are no Pines on the mountain. The temperature was not low; it was 50° on the summit, at seven A.M., in January; and as to the statement that Pines do not grow on Moolee-it, I can only say that the mountains near Tounghoo, about two hundred miles to the north, are covered with a species of which I have received branches and cones, gathered at an altitude of 8000 feet, and which prove to be those of *P. longifolia*.

I deeply regretted my inability to accompany Captain Tickell to Moolee-it, which, in very clear weather, may be descried from hence, and is about seventy or eighty miles distant. It is very inaccessible; there are no roads or inhabitants in that part of the country. Captain Tickell of course commanded the services of the Burmese wherever he went, taking them from the nearest villages, and making them show him the way: he had as many as a hundred men with him, and eight elephants. Night after night he and his party encamped in the jungle. The ascent was extremely difficult, and the whole expedition one which a naturalist alone would have undertaken. What a pity that I could not go with him, and that my friend has no knowledge of botany! Never did I regret anything so much in all my life. I am never likely to be able to command the necessary means for such a tour, even if I had the time to devote to it. Possibly Captain Tickell may go again, and I may be so fortunate as to accompany him, at least for a few days, next season; if I do, you may depend on my making good use of my time. Ferns and Mosses are my favourite plants, and I know but little of other kinds; still my ignorance shall not prevent my collecting everything I can find.

At Mergui I gathered a splendid *Platygyerium*, neither *P. alaicorne* nor *P. grande*: is it new? Do you know of any species still larger and finer than the latter? If not, I have one incomparably excelling it; it has a crown, and sessile fronds, two feet across and two feet high, and pendent fronds three feet long and repeatedly dichotomous; fruc-

* In all probability *Platygyerium bifornae*.

tification a half-cup and pedicelled. If I go to the south again, in two or three months, I will secure specimens, which I shall be happy to send you; kindly tell me the best means of doing so. I am most anxious to know if this noble Fern is an undescribed species. When you have leisure to attend to them, I should like to trouble you with some Ferns, Mosses, and *Jungermanniæ*.

There is a wonderful field open to discovery in this neighbourhood; but I am unfortunately so tied by my duties that I cannot collect and explore as I should like; a week or ten days is the utmost I can ever command, and this is tantalizing, for the distances are great and the difficulties of travelling extreme.

August 31, 1855.

I have the pleasure to enclose a rather better sketch of the *Platycecerium* than I sent before; it conveys a tolerably correct idea of the Fern, which is a truly magnificent species. If I go to Mergui, as I hope, in October, I will get more specimens, for I know its precise locality, on an aged veteran of a *Lagerstræmia*, a sight of itself, and which is rendered strikingly beautiful by the numerous (twenty or thirty) plants of this Fern which festoon it with their long, pendent, and graceful fronds. But if I send you two growing specimens, it will be as much as I can compass, for they are of no small size or light weight, and, when accompanied by the bough to which they are attached, each is a man's burden. How to dry specimens of it for the herbarium is quite a problem to me; its fronds are like leathern thongs, and the cup which bears the sorus is as stiff as a leathern drinking-cup.

I have carefully examined the drawing of the plant from Mooree-it, and am convinced it is a true and very beautiful *Rhododendron*. The petals are pale rose-coloured, and the entire flower measures nearly four inches across: it is said to be a large shrub. My own specimen looks very sickly, and will not, I fear, bear the climate here. The seeds must have been ripe when Captain Tickell drew it, for he represents the split capsules, but he unfortunately collected none.

Some time ago I gathered a beautiful Orchideous plant, with pink-flowered spikes, something like a Hyacinth; it grows on rocks about twenty miles from hence. The specimens I brought home are flourishing with me, and I would gladly send them, if you think the species is

likely to be new. I found also a fine *Melastoma*, larger-flowered than *M. Malabathrica*, though not so handsome in its form and general aspect.

If I could have a list of all the known East Indian Ferns, it would be a great help to me in collecting these plants.

BOTANICAL INFORMATION.

THE MAMMOTH TREE.*

At the request of our obliging correspondent, Alex. G. Taylor, Esq., of Monterey, the proprietors of the locality of this now celebrated tree, Messrs. Lapham and Haynes, have sent to us the following "*Description of the Mammoth Tree Grove*," accompanied by a well-executed landscape,† drawn on the spot, and engraved at San Francisco, and which we are sure faithfully represents the remarkable spot. Around the picture are compartments, with separate views of the more remarkable trees of the place.

"This gigantic forest is situated in a small valley at the source of one of the tributaries of the Calaveras River, Calaveras County, California. Arriving at Murphy's by one of the daily line of stages, either from Sacramento City or Stockton, or by the Sonora coach, the traveller finds himself within fifteen miles of this celebrated grove. Here animals or vehicles can be procured at all times, and at reasonable rates. Leaving Murphy's by an excellent carriage-road, and gradually ascending, winding through a splendid forest of pines, cedars, and firs, with occasional

* We will not offend our American friends by giving here the botanical name of the tree. It is unworthy a great nation to suppose that an eminent botanist, who first distinguishes the true characters of a new plant, is not entitled to give it what name he pleases, provided he infringes no botanical rule,—of a tree too, unquestionably first brought into scientific notice by an English traveller.—*Ed.*

† This interesting lithograph-plate is placed in the Museum of the Royal Gardens of Kew. The roller about which the print was wound is made of the wood of the tree, and is also deposited in the Museum. It is not a hard wood, and it has no fragrance, otherwise it much resembles the cedar-pencil wood (*Juniperus Virginiana*). Still more recently we have received fresh seeds from Fras. Hobler, Esq., procured by his brother, George Hobler, Esq., in California; and seeds and cones and specimens of the branches, and a plank of the wood, from Dr. Torrey, collected by Dr. J. M. Bigelow in one of the Pacific Railroad Surveys ordered by the United States Government.—*Ed.*

oaks, often catching a glimpse of the adjacent pine-clad mountains, the Mammoth Tree Hotel is reached in two and a half or three hours. Here the proprietors, Messrs. Lapham and Haynes, offer every accommodation to parties, visitors, or boarders, at reasonable charges, it being their aim to make the Grove a fashionable and popular place of resort. The valley in which these trees are found contains about one hundred and sixty acres of land, and it is estimated to be four thousand feet above the level of the sea. The distance from Sacramento City by the stage-route is ninety-five miles, and from Stockton eighty-five miles.

"Ninety-two trees of this species are now standing, and are all found within an area of fifty acres of the valley. They are evidently a gigantic species of Cedar, as is indicated by the growth, bark, and leaf; according to botanists however they belong to the family of *Taxodiums*, and have been justly named *Washingtonia gigantea*, and are beyond doubt the most stupendous vegetable products upon earth. They were discovered early in 1850 by hunters, whose accounts were considered fabulous until confirmed by actual measurement.

"Wm. W. Lapham, one of the present proprietors, located and settled here in July, 1853.* The valley enjoys a delightful climate during the summer months, entirely free from the scorching heats of the lower country, the vegetation remaining fresh and green, while the water is a perfect luxury, pure as crystal, and almost as cold as ice. The vicinity offers every inducement to sportsmen: all kinds of game common to the country abound, while the adjacent streams afford excellent trout-fishing. Delightful horseback or buggy rides conduct the visitor to many interesting points of scenery or objects of curiosity, among which may be mentioned the Falls of the San Antone, and the Basaltic Cliff on the North Fork of the Stanislaus River.

"1. Adjoining the hotel, with which it is connected by a floor, stands the stump of the big tree, covered by a rustic arbour; it measures 96 feet in circumference and is 7 feet high. A section of two feet was taken from this stump, also a section of bark 50 feet long, by Capt. Hanford, and carried to New York for exhibition; they are now in Paris. The surface of the stump is smooth, and affords ample space for thirty-two persons to dance, it being 75 feet in circumference, solid

* In the same year, and, it would appear, nearly at the same time, Mr. Wm. Lobb collected copious seeds and specimens. As soon as possible thereafter he returned to England with his treasures; and the discovery and particulars of the tree were given by Dr. Lindley in the 'Gardeners' Chronicle' for December of the same year.—Ed.

timber; theatrical performances have also been given upon it by the 'Chapman Family' in May, 1855, also the 'Robinson Family,' July 4, 1855. This monster tree was cut down by boring with augers, and sawing the spaces between: it required the labour of five men twenty-five days to effect its fall, the tree standing so nearly perpendicular that a wedge and battering-ram were necessary to cause its fall after being fully cut off.

"2. Adjoining the stump lies a section of the trunk; this is 25 feet in diameter and 20 feet long; beyond lies the immense trunk, as it fell, measuring 302 feet from the base of the stump to its extremity: upon this is situated the bar-room and Ten-Pin Alley, stretching along its upper surface for a distance of 81 feet, affording ample space for two alley-beds side by side.

"3. Leaving the hotel, let us walk into the forest by the upper trail, or we can ride (for the road has been opened so as to permit any vehicle to pass): we are at once struck with astonishment at the magnitude of the trees, and, passing several immense ones, we reach the 'Miners' Cabin'; this tree measures 80 feet in circumference, and is about 300 feet in height; the 'Cabin,' or burnt cavity, measures 17 feet across its entrance, and extends upward of 40 feet.

"4. Continuing our ramble, admiring the luxuriant growth of underbrush, consisting of young firs, cedars, dogwood, and hazel, we reach the 'Three Graces'; these splendid trees evidently grow from one root, and are the most beautiful group in the forest; towering side by side to the height of 290 feet, tapering symmetrically from their base upward, their united circumference amounts to 92 feet: it is 200 feet to the first limb on the middle tree.

"5. The 'Pioneers' Cabin' is the next tree that arrests our attention, rising to the height of 150 feet, the top having been broken off; this tree measures 33 feet in diameter.

"6. Continuing our walk, we reach a forlorn-looking tree, having many rents in his bark, and withal the most seedy-looking individual in the forest; this is the 'Old Bachelor;' he is about 300 feet high and 60 feet in circumference.

"7. The next tree is the 'Mother of the Forest;'* this magnificent tree rises to the height of 327 feet and is 90 feet in circumference.

* The view of this tree leaves an unfavourable impression on the mind; for, still standing (and for the present living), it is denuded of its bark for 120 feet from the base: around this portion is a scaffold and a zigzag staircase.—Ed.

The scaffolding by which the bark was reached and taken off is also seen in the view. This tree was stripped of its bark to the height of 120 feet, in the spring of 1854, by Mr. George Gale, requiring the labour of five men ninety days; during this time a person fell from the staging 100 feet, but fortunately escaped with a broken limb. The tree is still green and flourishing, showing no signs of decay.

" 8. We are now amidst the 'Family Group,' and standing near the uprooted base of the 'Father of the Forest;' the scene is grand and beautiful beyond description; the venerable 'Father' has long since bowed his head in the dust, yet how stupendous even in his ruin! he measures 112 feet in circumference at the base, and can be traced 300 feet, where the trunk was broken by falling against another tree; it here measures 18 feet in diameter, and according to the average taper of the other trees, this venerable giant must have been 450 feet in height when standing. A hollow chamber, or burnt cavity, extends through the trunk 200 feet, large enough for a person to ride through; near its base a never-failing spring of water is found; walking upon the trunk, and looking from its uprooted base, the mind can scarcely conceive its prodigious dimensions! while on either hand tower his giant sons and daughters, forming the most impressive scene in the forest.

" 9. Passing onward, we reach the 'Husband and Wife,' leaning affectionately toward one another; they are each 60 feet in circumference and 250 feet in height.

" 10. 'Hercules,' one of the most gigantic trees in the whole forest, stands leaning in our path; this tree, like many others, has been burned at the base; it is 325 feet high and is 97 feet in circumference. This specimen would make 72,500 feet of lumber: upon the burnt space near the base is the inscription 'J. M. Wooster, Ju. 1850,' supposed to have been made by the discoverer of the grove.

" 11. The 'Hermit,' standing solitary and alone, is next observed; this tree, straight and well-proportioned, measures 320 feet high and 60 feet in circumference.

" 12. Still returning towards the hotel by the lower trail, we pass the 'Mother and Son,' which together measure 93 feet in circumference; the 'Mother' is 320, the 'Son' a hopeful youth of 300 feet.

" 13. The 'Siamese Twins and Guardian' form the next group; the 'Twins' have one trunk at the base, separating at the height of 40 feet, each measuring 300 feet high; the 'Guardian' is 80 feet in circumference and is 325 feet high.

" 14. Beyond stands the 'Old Maid,' slightly bowing in her lonely grief; she measures 60 feet in circumference and is 260 feet high.

" 15. Two beautiful trees, called 'Addie and Mary,' are the next to arrest our attention, measuring each 65 feet in circumference and nearly 300 feet high.

" 16. The 'Horseback Ride' we reach next; this is an old, fallen trunk of 150 feet in length, hollowed out by the fires which have, in days gone by, raged through the forest; the cavity is 12 feet in the clear, in the narrowest place, and a person can ride through, on horseback, a distance of 75 feet. Passing onwards we observe several Yew-trees; from this timber the Indians construct their bows, it being exceedingly close-grained and elastic.

" 17. 'Uncle Tom's Cabin' next claims our admiration; this tree is over 300 feet high and is 75 feet in circumference. The 'Cabin' has a narrow burnt entrance of $2\frac{1}{2}$ feet in diameter; inside, the cavity is large enough to seat fifteen persons.

" 18. Two other trees next attract our gaze, one of which, named the 'Pride of the Forest,' noted for the smoothness of its bark, measuring 280 feet in height and 60 feet in circumference.

" 19. The "Burnt Cave" is also a remarkable feature in the forest; it measures 40 feet 9 inches across its roots, while the cavity extends to the distance of 40 feet, large enough for a horseman to ride in, and, turning around, return.

" 20. We now reach the 'Beauty of the Forest' [seen in view a little to the right of the Ten-Pin Alley]; this beautiful tree is 65 feet in circumference, and full 300 feet high, symmetrical in its form, and adorned with a magnificent crest of foliage.

" 21. Reaching the road, and returning to the house, we pass the 'Two Guardsmen' (two large trees to the right in centre view); the new road to the hotel will pass between these majestic sentinels, which tower to the height of 300 feet, and are 65 and 70 feet in circumference, forming an appropriate gateway to this wonderful forest.

" Much more might be said in relation to the forest and surrounding country, but with the present and continually-improving facilities of travelling, let every person who wishes to spend a few days or weeks pleasantly and with profit, examine for themselves the 'Mammoth-Tree Grove.' "

Plants of M. BOURGÉAU, collected in Teneriffe.

This excellent and indefatigable Collector has again safely returned to Paris, after a spring and summer devoted to botanical researches in the Canary Islands. Besides a beautiful *suite* of samples of the woods of Teneriffe and living succulent plants (chiefly *Crassulaceæ*), and cuttings from the celebrated Dragon-tree of Orotava, for the Royal Gardens of Kew, M. Bourgeau has brought home a noble harvest of dried specimens. In forming this collection he has neglected all the well-known European plants, and has gathered, of the more interesting, sixty sets of 390 species, for which there are already fifty subscribers. Those who know the beauty and perfection of M. Bourgeau's specimens, and the very moderate price (30 francs the century), will not delay procuring them. Letters may be addressed to M. Bourgeau, 14, Rue St. Claude-au-Marais, Paris.

The late Mr. David Douglas.

We were glad to read in a Californian newspaper, of the present year, the following intelligence from Hawaii, in the Sandwich Islands:—

“On a reçu de San Francisco un monument en marbre blanc, érigé par M. Julius L. Brenchley à la mémoire d'un illustre voyageur, l'infortuné David Douglas, qui mourut en 1834 au pied du Maunakea, dans l'île de Havaii, assassiné, suivant les uns, par un convict échappé de Botany Bay; massacré, suivant les autres, par un bœuf sauvage et furieux. Ce monument, qui fait honneur au patriotisme et à la générosité dont M. Brenchley a laissé tant de traces dans nos îles, porte l'inscription suivante:—

Hic jacet
D. DAVID DOUGLAS,
Scotiâ, anno 1799, natus;
Qui,
Indefessus viator,
A Londinensi Regiâ Societate Horticulturali missus,
In Havaii saltibus
Die 12^a Julii, A.D. 1834,
Victima scientiæ
Interiit.

‘Sunt lacrymæ rerum et mentem mortalia tangunt.’—VIRG.

“Douglas est enterré dans le Cimetière de la grande église à Ho-

nolulu. Sa tombe, qui était confondue avec celles de kanaks obscurs, va recevoir enfin une distinction méritée et trop longtemps attendue.”

Mr. Veitch.

Few men have done more to serve the cause of botany and horticulture, by the quantity of new or rare and beautiful plants introduced to our gardens and stoves and greenhouses, than Mr. Veitch, of the Exotic Nurseries of Exeter and Chelsea; plants too from various regions of the globe, collected by travellers that he has sent out at great expense, and through a long series of years,—chiefly by two brothers, the Messrs. Lobb. The researches of one, William Lobb, have extended, in the New World, from the extreme south in Patagonia and Chili to the Oregon country in the north; while those of Thomas Lobb, in the Old World, have been over a great part of the Continent of India, from east to west, and north from Himalaya to the Malay Islands, Java, Borneo, etc. We are glad to find that such services on the part of Mr. Veitch have been appreciated at the late great Exhibition at Paris, and that a silver medal has been awarded to him, not as an exhibitor, but as a co-operator, in furthering the cause of science; and no man could deserve it better. That his son in the firm, Mr. James Veitch, jun. (the firm is James Veitch and Son), could not be included in the award, is simply owing to his having been engaged a less period of time in their extensive concerns.

NOTICES OF BOOKS.

GÉOGRAPHIE BOTANIQUE RAISONNÉE, ou *Exposition des Faits principaux et des Lois concernant la Distribution Géographique des Plantes de l'époque actuelle*; par M. ALPH. DE CANDOLLE. 2 vols. 8vo. Paris.

(Continued from p. 88.)

The 9th Chapter is devoted to a series of discussions upon the native countries of the majority of cultivated plants, and is full of curious matter, the fruit of careful research. It is divided into two Sections, whose titles appear paradoxical at first sight, being (1) species culti-

vated intentionally (*volontairement*), and (2) those that are cultivated in opposition to the wishes of man, those plants, namely, which intrude themselves amongst those cultivated by man, and which are found nowhere else. The latter subject is dismissed in a very few sentences, the plants alluded to having been previously enumerated under the head of naturalized species. The subject is however, we think, capable of much fuller elucidation than it has yet received, and is a very curious and interesting one.

Under the head of History and Origin of Cultivated Plants, M. de Candolle arranges the latter according to the organs for which they are cultivated, as for their roots, bulbs and tubers, stems, leaves, flowers or bracts, fruits, and seeds; to this list might have been added those cultivated in tropical countries especially, for the beauty or odour of their flowers, as various *Hibisci*, the *Nyctanthes Arbor-tristis*, and Horse Chestnut, of which the origin is supposed to be unknown, but of which some, at any rate, may be traced to known wild species, of which they appear to be varieties induced by cultivation.

Following the discussions on the origin of the cultivated species, are tabulated results, in which the species treated of are arranged according to the following classes:—

1. Those found absolutely wild, and about whose specific identity there need be no question. (85 species.)

<i>Solanum tuberosum</i> , L.	<i>Onobrychis sativa</i> , Lam.	<i>Citrus medica</i> , Gall.
<i>Dioscorea pentaphylla</i> , L.	<i>Trifolium pratense</i> , L.	„ <i>Limonum</i> , Gall.
„ <i>bulbifera</i> , L.	<i>Cichorium Intybus</i> , L.	<i>Garcinia Mangostana</i> , L.
„ <i>aculeata</i> , L.	„ <i>Endivia</i> , L.	<i>Mammea Americana</i> , L.
„ <i>deltoidea</i> , Wall.	<i>Rumex Patientia</i> , L.	<i>Vitis vinifera</i> , L.
<i>Ipomœa mammosa</i> , Choisy.	„ <i>Acetosa</i> , L.	<i>Anacardium occidentale</i> , L.
<i>Brassica campestris</i> , L. (et	<i>Allium Cepa</i> , L.	<i>Fragaria vesca</i> , L.
B. Rapa).	<i>Thea Chinensis</i> , Lour.	<i>Rubus Idaeus</i> , L.
„ <i>Napus</i> , L.	<i>Ilex Paraguayensis</i> , St. Hil.	<i>Prunus Avium</i> , L.
„ <i>oleracea</i> , L.	<i>Indigofera argentea</i> , L.	„ <i>Cerasus</i> , L.
<i>Raphanus sativus</i> , L.	<i>Erythroxylon Coca</i> , Lam.	„ <i>domestica</i> , L.
<i>Daucus Carota</i> , L.	<i>Morus alba</i> , L.	„ <i>insititia</i> , L.
<i>Pastinaca sativa</i> , L.	„ <i>nigra</i> , L.	<i>Prunus Armeniaca</i> , L.
<i>Campanula Rapunculus</i> , L.	<i>Humulus Lupulus</i> , L.	<i>Amygdalus communis</i> , L.
<i>Allium sativum</i> , L.	<i>Crocus sativus</i> , L.	<i>Pyrus communis</i> , L.
<i>Rubia tinctorum</i> , L.	<i>Anona squamosa</i> , L.	„ <i>Malus</i> , L.
<i>Cannabis sativa</i> , L.	„ <i>muricata</i> , L.	<i>Cydonia vulgaris</i> , L.
<i>Medicago sativa</i> , L.	„ <i>reticulata</i> , L.	<i>Punica Granatum</i> , L.

Jambosa Malaccensis, <i>Wight</i>	Musa sapientum, <i>Br.</i>	Pisum sativum, <i>L.</i>
et <i>Arn.</i>	Bromelia Ananas, <i>L.</i>	Lathyrus sativus, <i>L.</i>
Lagenaria vulgaris, <i>Ser.</i>	Triticum vulgare, <i>L.</i>	„ Cicera, <i>L.</i>
Cucurbita ovifera, <i>L.</i>	„ Spelta, <i>L.</i>	Vicia sativa, <i>L.</i>
Cucumis Melo, <i>L.</i>	Hordeum distichum, <i>L.</i>	Camelina sativa, <i>Crantz.</i>
Ribes rubrum, <i>L.</i>	Oryza sativa, <i>L.</i>	Juglans regia, <i>L.</i>
Olea Europæa, <i>L.</i>	Polygonum Tataricum, <i>L.</i>	Theobroma Cacao, <i>L.</i>
Lucuma mammosa, <i>Gærtn.</i>	Lupinus albus, <i>L.</i>	Cocos uncinata, <i>L.</i>
Sapota Achras, <i>Mill.</i>	„ Termis, <i>L.</i>	Coffea Arabica, <i>L.</i>
Persea gratissima, <i>Gærtn.</i>	„ hirsutus, <i>L.</i>	Gossypium punctatum, <i>Sch.</i>
Papaya vulgaris, <i>DC.</i>	Pisum arvense, <i>L.</i>	et <i>Th.</i>
Phoenix dactylifera, <i>L.</i>		

2. Those found apparently wild, but not certainly so, being perhaps naturalized escapes from cultivation, but all retaining the appearance of the same plant in its cultivated state. (21 species.)

Arum Colocasia, <i>L.</i>	Psidium Guajava, <i>Raddi.</i>	Faba vulgaris, <i>Mœnch.</i>
Linum usitatissimum, <i>L.</i>	Artocarpus integrifolia, <i>L.</i>	Ervum Lens, <i>L.</i>
Morus Indica, <i>Willd.</i>	Avena sativa, <i>L.</i>	Cicer arietinum, <i>L.</i>
Spinacia oleracea, <i>L.</i>	Triticum monococcum, <i>L.</i>	Sesamum orientale, <i>L.</i>
Indigofera tinctoria, <i>L.</i>	Secale cereale, <i>L.</i>	Papaver somniferum, <i>L.</i>
Citrus Aurantium, <i>Risso.</i>	Polygonum Fagopyrum, <i>L.</i>	Gossypium herbaceum, <i>L.</i>
„ Javanica, <i>Blume.</i>	„ emarginatum,	
Persica vulgaris, <i>Mill.</i>	<i>Roth.</i>	

3. Those found certainly wild, but which, not exactly resembling the cultivated forms, are open to doubts. (6 species.)

Beta vulgaris, <i>Moq.</i>	Mangifera Indica, <i>L.</i>
Lactuca Scariola sativa.	Ribes Grossularia, <i>L.</i> (under the form of
Allium Porrum, <i>L.</i> (under the form of	R. Uva-crispa).
A. Ampeloprasum).	Gossypium arboreum, <i>L.</i>

4. Doubtful as wild, and also as to their specific identity with the cultivated plants. (5 species.)

Manihot utilisima, <i>Pohl.</i>	Ficus Carica, <i>L.</i> , and allied	Hordeum vulgare, <i>L.</i>
„ Aipi, <i>Pohl.</i>	species.	Zea Mays, <i>L.</i>

5. Unknown in a native state, and undoubtedly distinct from any known wild plant. (32 species.)

Dioscorea alata, <i>L.</i>	Agave Americana, <i>L.</i>	Nicotiana Tabacum, <i>L.</i>
Batatas edulis, <i>Choisy.</i>	Saccharum officinarum, <i>L.</i>	„ rustica, <i>L.</i>
Helianthus tuberosus, <i>L.</i>	„ violaceum, <i>Juss.</i>	„ Chinensis, <i>Fisch.</i>
Arracacha esculenta, <i>Banc.</i>	„ Sinense, <i>Rarb.</i>	„ Persica, <i>Lincll.</i>

Caryophyllus aromaticus, <i>L.</i>	Cucumis Citrullus, <i>L.</i>	Triticum turgidum, <i>L.</i>
Anona Cherimolia, <i>Lam.</i>	„ sativus, <i>L.</i>	Hordeum hexastichon, <i>L.</i>
Citrus vulgaris, <i>Risso</i> (<i>C.</i> Chrysophyllum Cainito, <i>L.</i>	Avena orientalis, <i>Shreb.</i>	
Aurantium amarus).	Solanum esculentum, <i>Mill.</i>	Phaseolus vulgaris, <i>L.</i>
Citrus Japonica, <i>Thunb.</i>	Lycopersicum esculentum, <i>Willd.</i>	Chenopodium Quinoa, <i>Willd.</i>
Eriobotrya Japonica, <i>Lindl.</i>	<i>Mill.</i>	Arachis hypogæa, <i>L.</i>
Jambosa vulgaris, <i>DC.</i>	Artocarpus incisa, <i>L. f.</i>	Gossypium Barbadense.
Cucurbita maxima, <i>Duch.</i>		

6. Those that are unknown in a wild state, but which are perhaps only cultivated varieties of known wild species. (6 species.)

Arum esculentum, <i>Forst.</i>	Persica lævis, <i>Mill.</i> (var.?	Cucurbita Melopepo, <i>L.</i>
Citrus Decumana, <i>Willd.</i>	P. vulgaris).	Avena nuda, <i>L.</i>
Allium Ascalonicum, <i>L.</i>		

7. Those that are unknown in a wild state, but are equally doubtful as species :—

Indigofera Anil, <i>L.</i>	Milium,	} Various forms.
Cucurbita Pepo, <i>Duch.</i>	Sorghum,	
	Phaseolus,	
	Dolichos,	
	Capsicum,	

Upon the whole this extremely difficult subject is treated throughout with considerable skill and great learning. Absolute data are however wanting for ascertaining the origin of many, and especially of locally cultivated species; and we fear that we should have reduced the first class and enlarged the second.

This subject naturally leads to another still more embarrassing,—the original countries of the cultivated species. By far the greater majority are assigned to the Old World: 35 to Europe, 33 to Northern and Western Asia, 1 (Date) to North Africa, 3 (one kind of Indigo, Coffee, and one kind of Cotton) to Tropical Africa, 40 to Southern Asia and the Malay Archipelago; none to South Africa or Australia or New Zealand, and a few are doubtful; 33 are assigned to America. One only (*Cucurbita Melopepo*, *L.*) is wholly unknown, and considered as probably a cultivated race of some existing wild species.

The most striking result, as it appears to M. de Candolle, to be derived from the above inquiry, is the great antiquity of the majority of the cultivated varieties or races. In the sixteenth century the principal kinds of Cabbage, Turnip, and Gourds were known; besides cereals and fruit-trees, whose identity with those now cultivated is less

evident. The Romans, in the days of Pliny, cultivated many varieties of Pears and Plums. Homer distinguished Poppies with black and white seeds. The Egyptians cultivated white-seeded *Sesamum*. The Hebrews distinguished the sweet and bitter Almond; and the black and white Grape appear to be of great antiquity. Hence it appears that perhaps too much influence is attributed to cultivation, which effects many small changes, whilst truly hereditary races are always very ancient; that is to say, they date from a period that is altogether prehistoric, if indeed they are not older than the art of cultivation.

What appears equally curious is, that certain cultivated plants which are so closely allied that it is doubtful whether they are species or varieties, as the two Guavas, *Psidium pomiferum* and *pyriferum*, the sweet and bitter Orange, the Peach, and Nectarine, are also of very considerable antiquity.

Chapter 10 is devoted to the study of what M. de Candolle calls "Especies disjointes," or species whose individuals are disconnected by large expanses of land or water, but which cannot have been transported from one country to the other on account of the size or structure of their seeds, or of some obstacle presented by their habits of life. These come under three principal categories:—1. Woody plants with bulky seeds, that are not littoral; 2. Fresh-water plants; and 3. Mountain plants.

The facts here adduced are very numerous, well arranged, and some of them most curious; and though very often discussed, have hitherto met with no plausible explanation; perhaps the most striking are, that of *Eriocaulon septangulare*, which is confined in the Old World to a very few spots in the extreme west of Ireland and Scotland, but which is common in North America from Newfoundland to the Saskatchewan River;—*Phryma leptostachya*, L.,* a native of the mountains of Nepal and the United States of America;—and *Spiranthes cernua*, Rich., found in one spot in the south of Ireland and in the Northern United States and Canada, etc. With regard to the *Phryma*, M. de Candolle inclines to the hypothesis of a double creation, whilst he thinks the *Eriocaulon* may have been transported at a remote period, when the plant had a

* The *Phryma* however is much less local than M. de Candolle supposes. In the Himalaya it ranges from Kumaon to the confines of Bhotan, and also occurs in the Khasia Mountains: of the countries between these last and the east coast of Asia absolutely nothing is known. *Phryma* is an extremely difficult plant to find in the woods it inhabits, and may be much more common than is usually supposed.

wider range in America, and when the oceanic currents between Canada and Scotland were stronger and more direct.

Under the head of tropical disconnected (*disjointes*) species a list of a considerable number is given, with the caution that many may be considered as naturalized. About 50 however remain as most unlikely to have been transported by causes now in operation, and the majority, without being truly aquatic, inhabit moist places. It appears proved to M. de Candolle that the "disconnected species" are much less numerous in the tropics than in the northern extra-tropical regions;* and upon the whole the study of the tropical species leads M. de Candolle to the same general conclusion as that of the extra-tropical, viz. that in the present state of our knowledge there appears to be no direct solution of the problem of their dispersion.

Chapter 11. On the early condition and probable origin of existing Species in a state of Nature.—Under the first division of this subject M. de Candolle declares the impossibility of explaining many facts, from a study of the species themselves in relation to the existing condition of things on the earth's surface. He observes that in numerous cases he has been obliged to own that existing causes are insufficient to explain well-established facts in distribution, and that the true but anterior causes must be sought in different conditions of different areas on the globe, in different states of species, or in a different distribution of land and sea, in changes of climate, and in different means of transport.

The facts that have led to this conclusion are:—

1. Certain species are wanting in regions so well adapted to their existence, that when once artificially introduced there, they forthwith establish themselves like natives of the country.
2. Woody plants flourish in mass in countries where the same species cannot re-establish themselves after they have been once removed.
3. Species with large seeds grow in countries between which there are insuperable obstacles to their seeds having been transported.
4. Many species are common to the tops of very distant mountains, between which an interchange of seeds seems to be inconceivable.
5. With regard to widely distributed aquatic, etc. plants, many

* A conclusion the accuracy of which we extremely doubt, for reasons stated in a note to page 62. That there are however fewer disconnected species in proportion to the whole tropical than temperate flora, is most likely the case.

have seeds that only ripen under water and sink; others have seeds that present no facilities for transport by winds, cannot have been introduced by man, and will not endure exposure to salt-water.*

6. Certain countries, separated by wide expanses of ocean, have more species in common than either the distance or nature of these climates would render probable under ordinary circumstances; whilst contiguous countries, with similar climates, sometimes present very different species.

7. Some countries are remarkable for the great number of species they contain in a small area, others for comparative poverty.

8. Species of simple structure have often wide ranges, though their seeds are not well adapted for transport; on the other hand, many species, whose seeds appear perfectly adapted to secure a wide distribution, have very narrow ranges.

All these phenomena direct the attention of the inquirer to a different order of things to that now existing; that is, to a former epoch, namely, to the quaternary† period of geologists, if not to a still earlier date in the world's history. Mention is made of the late Professor E. Forbes‡ as the strenuous supporter of this view.

Under the head of proofs of the historical antiquity and indications of the geological antiquity of the greater part of existing species, M. de Candolle boldly states that this can be demonstrated both *à priori* and by some observations of geologists. Under the *à priori*, he alludes

* Mr. Darwin's experiments on the power which seeds have of retaining their vitality when exposed to the effects of salt-water (*Gardeners' Chronicle*, 1854-5) were of course unknown to M. de Candolle.

† The Post-pleiocene of English geologists, or that immediately preceding the present.

‡ M. de Candolle mentions the opinions of Forbes, given in his well-known Essay, as ingenious hypotheses concerning one region of the globe only, and applicable only to a part of the phenomena to which his book is devoted; and he professes to take a more general view, to examine the foundations of the hypothesis, to discuss its probability, and to compare it with other theories. M. de Candolle here perhaps hardly recognizes sufficiently the real value of Forbes's Essay, and that the evidences of the probable truth of the hypotheses he advocates rest upon geological and zoological facts; for though a vast number of difficult phenomena in the geographical distribution of plants, cited by Forbes, De Candolle, and others, may be explained by the hypothesis, none of these can be said to afford anything approaching to proof of it. Forbes had animals and shells, both in a recent and fossil state, to reason from, occupying in part the areas now occupied by the plants now existing, and in part also ancient rocks, whose geological relations were not only well known, but the theory of whose formation is proved. These points are however fully admitted at the conclusion of the volume.

to the hereditary character of specific forms, as derived from the Egyptian sculptures, adding, that stability (permanence) of form is the hypothesis that must present itself first to any unprejudiced observer, whilst it is for those who demand a constant renewal of forms to prove their position; and as to those geologists who maintain that every well-marked geological epoch has different plants as well as different animals, M. de Candolle thinks that their assumption is too absolute.*

Retaining the proofs of the antiquity of existing species, the weight of the evidence rests, more or less directly, on two main classes of facts: of these, to the first belong the imbedded remains of plants, believed to be specifically identical with existing ones, in bogs and in the sea, whose submersion or imbedding in all cases precedes the historical era, and in some cases, owing to the bulk or character of the superincumbent soil, or to the nature of the animal remains imbedded with them, may fairly be considered as preceding the existing geological condition of the country. Sir Charles Lyell's 'North American Travels' afford M. de Candolle the best cases in point, and his other works many more. A unique case is that of the identification, by M. Brongniart, of the nut of a species of Hickory found in the pleiocene beds of Europe, with that of a North American species. M. de Candolle however adds the caution, that this does not prove specific identity, as the flowers, leaves, etc. of the plants may be different.†

* Upon this point the views of our best English geologists would certainly agree with M. de Candolle's, and we would add that there is still much to be learnt upon this subject from the distribution of plants. The difference between the existing Floras of Europe and Australia is the equivalent of two geological epochs, so distinct that a palæontologist would demand the lapse of an indefinite number of intervening centuries between the times during which each flourished, supposing them to be superimposed, or in close proximity. But though Europe and Asia are not juxtaposed, Australia and New Zealand are, and they present analogous differences, as do South-east and South-west Australia. If allowance is not made by geologists for possible great differences between the inhabitants of adjacent countries, still less is often granted for local distribution. The species and genera of one Flora are so distributed that contiguous spots present different assemblages, and it is these local causes that lead to the imbedding of fossils that also determine the kind of plants to be imbedded. Again, fossils are too often regarded as affording absolute proof of the character of the Flora to which they belonged, whereas they may be only indications of the prevalence of a species, the genus or order of which is otherwise absent or extremely rare at the same epoch; for instance, it is often the case that one species of Fern is so abundant over an area where Ferns form a small proportion of the Flora, that it would probably be found in every bed of fossils; whilst *Conifere*, which form a larger proportion of the Flora of Tasmania than any equivalent area, are so scarce in individuals there that they would appear very rarely amongst other fossil remains.

† This reminds us of a point much insisted upon by Edward Forbes, and which

The second class of facts adduced is the high antiquity of many timber-trees. It is unphilosophical to assume that these aged individuals, which are 3000 years old at a moderate computation, are the parents of their kind; whilst to suppose them even the grandsons of the first parent of the species, is giving the latter a startling antiquity. M. de Candolle does not allude to the argument derived from the known geological antiquity of many animal species, which, though no proof of an equal duration for the life of vegetable species, renders it unphilosophical to deny it; whether we consider plants and animals as parallel series of the great kingdom of organic nature, or the fact of so many animals being dependent upon individual species of plants for their continued existence.

All further inquiry into these subjects is here suddenly suspended, the subject becoming complicated with, or contingent upon, the idea maintained by the inquirer as to the changes that time may or may not have effected upon species. An article is devoted to this, and it opens with the ominous title 'Définition de l'Espèce.' A good *résumé* is here given of all former definitions, together with the arguments for and against every clause in these. It is not our purpose to plunge into this sea of difficulties; it is enough to say that M. de Candolle believes in species as having definite existences, and considers his father's definition, of what they may be supposed to be, almost as good as can be given.

The changes which we ourselves witness are classed under—1. Variations. These are slight changes in individuals or in their parts, depending on varying seasons, climate, exposures, etc., and are of little moment. 2. Monstrosities. These need no definition. 3. Varieties. These involve physiological changes in the individual, which are propagated by division of it (budding, grafting, etc.), but which are lost by seed. 4. Races. These are peculiar states of species, which almost

has not yet been fully appreciated by geologists, which is, that specific identity of fossils in the beds of far distant countries is opposed to these being strictly contemporaneous. (See his Essay on the Indian Fossils, in the Geological Transactions.) There is no doubt but that the pleiocene and existing Floras of Europe would, if fully known, be ranked as belonging to very distinct geological epochs; but yet the pleiocene Flora of Europe may prove similar to the existing Flora of America. Granting such to be the case, how, after several succeeding geological epochs, when perhaps the genus *Juglans* will have disappeared, will it be possible to classify the rocks of Europe and America without confounding the European pleiocene with the now existing Flora of America?

invariably retain their peculiarities from generation to generation, both when propagated by seed and, more markedly still, when increased otherwise). As it is often impossible to tell what should be considered a race, and what a species, the existence of races may perhaps be assumed to present an insuperable obstacle to the determination of the limits of many species. It may take years to prove that a variety is nothing more than a variety; but it is obviously hopeless, in most cases, to expect to prove that a race is only a more permanent kind of variety. Recourse must be had to hybridizing, which however is not now held to be an absolute test. Analogy with other plants must also be appealed to; but the acknowledged fact that characters which are held to be of no more rank than variations in some plants, are of specific value in others, often renders this line of argument useless.

Under the head of changes that may be effected in species by causes protracted through many ages, or many thousands of years preceding the present, the subject of acclimation is discussed. Acclimation M. de Candolle holds (with Petit-Thouars and others) to be a chimera; plants either resist the effects of altered conditions and flourish, or succumb under them; they do not change their natures. On the other hand, he admits the existence of wild races of plants just as of cultivated races.

(To be continued.)

PIESSE, G. W. SEPTIMUS, Analytical Chemist; *The ART OF PERFUMERY, and the methods of obtaining the Odours of Plants; with instructions for the manufacture of Perfumes, etc.* 12mo. London. 1855. With woodcuts.

Among the varied products of vegetables the “odours” have been justly and universally celebrated in prose and in verse, and our author introduces, at the opening of his first Chapter, Thomson’s well-known and appropriate lines:—

“By nature’s swift and secret working hand
The garden glows, and fills the liberal air
With lavish odours.

There let me draw
Ethereal soul, there drink reviving gales,
Profusely breathing from the spicy groves
And vales of fragrance.”

The odours here alluded to are the natural odours of plants. The object of this book is to describe the mode of collecting and preserving these odours, so as to have them always at command, and more, how the odour of one particular plant is to be imitated by the use of other plants and other substances; for instance, that of *Heliotrope* is made, or imitated, by *Almonds* and *Vanilla*; and the *Extrait de Héliotrope*, as sold in the shops of Paris and London, "is really a very nice perfume, passing well with the public for a genuine extract of Heliotrope." Now all this is produced in the laboratory, and for this we are indebted to chemistry; and the history and mystery of the perfumery trade are here candidly laid before the public by one largely engaged in it, and in a way which does him much credit. M. Piesse accounts for the art of perfumery having attained so little distinction in this country by the secrecy that has been so long maintained regarding the various modes of preparation; and he agrees with Professor Solly that "it is a great mistake to think that a successful manufacturer is one who has carefully preserved the secrets of his trade, or that peculiar modes of effecting simple things,—processes unknown in other factories, and mysteries beyond the comprehension of the vulgar,—are in any way essential to skill as a manufacturer, or to success as a trader." Another reason, however, for the art of perfumery having attained so little celebrity among us, is perhaps to be found in the unsuitableness of our climate, to the fully eliminating the odours of many plants. The finest perfumes come from the southern regions. "The south of Europe is the only garden of utility to the perfumer. Grasse and Nice are the principal seats of the art, and, from their geographical position, the grower has at command that change of climate best fitted to bring to perfection the plants required for his trade."

The Preface and the Introductory Section say much in praise of perfumery; and we are assured that in neglecting to tutor the olfactory nerve, we are constantly led to breathe impure air, and thus poison the body by neglecting the warning given at the gate of the lungs. Persons who use perfumes are more sensitive to the presence of a vitiated atmosphere than those who consider the faculty of smelling as an almost useless gift. We certainly know many who consider it anything but a blessing to have the olfactory nerves so sensitive of odours, inasmuch as the less agreeable of these are the most prevalent, especially in cities and great towns: it would be otherwise were delicious odours more widely diffused.

The commercial value of these manufactured odours is exceedingly great: British India and Europe alone consume annually more than 150,000 gallons of perfumed spirits under various titles, such as *Eau de Cologne*, *Essence of Lavender*, *Esprit de Rose*, etc. A single perfumer of Grasse and Paris employs 80,000 lbs. of *Orange-flowers*, 60,000 lbs. of *Acacia* buds (*Acacia Farnesiana*), 54,000 lbs. of *Rose-leaves* (petals), 32,000 lbs. of *Jasmine-flowers*, 32,000 lbs. of *Violets*, 20,000 lbs. of *Tuberose*, 16,000 lbs. of *Lilac*, and still larger quantities of the more common scents, *Rosemary*, *Mint*, *Citron*, *Thyme*, etc. Eighty thousand persons are employed, directly or indirectly, in the South of France in extracting their odours; and tracts of *flower-farms* exist in Turkey, more extensive than the whole of Yorkshire. The various Essential Oils or Ottos, paying one shilling per pound duty, entered for home consumption alone, amounted in 1852 to 195,846 lbs.; and the duty, at that low rate, to £9766. 16s.

The several processes of *Expression*, *Distillation*, *Maceration*, and *Absorption* are explained, and then our Author proceeds to notice the plants alphabetically, from which the principal simple perfumes are derived. A list may not be unacceptable to our readers. *Allspice*. *Almonds*. *Anise*. *Balm*. *Balsam* (*Myroxylon peruiferum* and *Toluifera Balsamum*). *Bay* (*Sweet*). *Bergamot* (from the fruit of *Citrus Bergamia*). *Benzoin* (*Styrax Benzoin*), much used for pastilles and for *fictitious* Vanilla pomade. *Caraway*. "*Cascarilla*," this is mentioned as "*Cascarilla gratissima*," and as a Cape plant, together with "*Cascarilla fragrans* and *C. fragilis*," and the bark as used for making pastilles: but there must be some error, *Cascarilla* (meaning 'little bark' in Spanish) is given to very different plants. The Author probably intends *Croton Eleuteria*, but if so it is West Indian, not a Cape plant: and there are *Croton fragrans* and *Croton fragile*, but they are natives of South America. The genus *Cascarilla*, in botany, is confined to a group of plants detached from *Cinchona* (Peruvian Barks). *Cassia* (*Cinnamomum Cassia*). *Cassie*, flower-buds (or flower-heads) of *Acacia Farnesiana*. M. Piesse properly cautions the inexperienced not to confound *Cassie* with *Cassia*, previously named; the latter should be called *Acacia*. *Cedar-wood*; here we fear M. Piesse's botany is at fault, for he calls it the "*Lebanon Cedar-wood*" (meaning *Cedrus Libani*), but from his speaking of slips of its wood being used as matches for lighting lamps, and further, in describing in a letter to us the fragrant essential oil of this

wood (accompanying a sample for the Museum) as extracted from the shavings and refuse of "*Cedar-pencils*," it is clear that the so-called "Virginian Cedar" is intended, viz. *Juniperus Virginiana*. *Cedrat* and *Citron* (*Citrus Medica*). *Cinnamon* (*Cinnamomum verum*). *Citronella*, from an *Andropogon*, probably *A. Schœnanthus*. *Cloves*. *Dill* (*Anethum graveolens*). *Eglantine* (made of half-a-dozen plants,—excluding *Eglantine* or Sweet Briar, for that plant, we are told, does not itself find a place in the perfumer's "scent-room"). *Fennel-Flag* (*Acorus Calamus*). *Geranium* (chiefly *Pelargonium odoratissimum*). *Heliotrope* (already noticed). *Honeysuckle*, imitation only. *Hovenia*: a "market-article," made of Rose, Lemon, Clove, etc. *Jasmine*. *Jonquil*. *Laurel*; "from the berries of the *Laurus nobilis* and from the leaves of *Laurus Cerasus*." Now the *Laurus nobilis* is the Bay or Sweet Bay, already mentioned, and is of the Laurel family, and cannot have any "similarity of odour to the oil distilled from the Bitter Almond." No doubt the plant intended is the *Prunus Laurocerasus*, most improperly called in our gardens "*Common* (or *Cherry*) *Laurel*." *Lavender*: cultivated to a great extent at Mitcham, Surrey; and the essential oil from the plants of this establishment is said to realize eight times the price in the market of that produced in France or elsewhere, and is fully worth the difference for delicacy of odour. The view given of these grounds represents them very near the Crystal Palace, Sydenham. *Lemon*. *Lemon-grass* (*Andropogon Schœnanthus*). *Lilac*. *Lily* (of the valley), imitation. *Magnolia* (ditto). *Marjoram*. *Meadow-sweet*. *Mignonelle*. *Mint*. *Myrtle*. *Neroli*, or *Orange-flower*. *Nutmeg*. *Olibanum*. *Orris* (*Iris Florentina*). *Palm* (*Elæis Guineensis*?). *Patchouly* (*Pogostemon Patchouly*). *Pea* (*Sweet*). *Pine-apple*. *Pink*. *Rhodium*, distilled from *Convolvulus Scoparius*. *Rose*; the Otto or Attar of Roses of Cashmere is considered superior to any other: but the pure Otto requires to be diluted, or it has a "cloying sweetness." The finest preparation of Rose, as an odour, is made at Grasse in France. *Rosemary*. *Sage*. *Sandal*. *Sassafras*. *Storax* and *Tolu*. *Syringa*. *Thyme*. *Tonquin*. *Tuberose*. *Vanilla* (represented in the cut as growing on the outside of a hothouse). *Verbena*. *Violet*. *Vitiverb*, or *Kuskuss*, roots of *Anatherum* (not "*Anthoxanthum*" as stated at p. 142) muricatum. *Volckameria*, a mixture of Violet, Tuberose, Jasmine, Rose, and Musk. *Wall-flower*. *Winter-green*:* this professes to be *Trien-*

* The name "*Winter-green*" is usually given to the genus *Pyrola*. *Trientalis* is

talís Europæa, but very improbable; it “yields a perfuming Otto principally consumed in the perfuming of soaps;” so celebrated, however, as to justify an imitation, under the name, too, of *Iceland Winter-Green*, “a very nice handkerchief perfume,” made from tropical and other plants which never could grow in Iceland.

We have after the above, which come under the denomination of simple Extracts, a chapter or section on “*Bouquets and Nosegays*,” so called in the trade, being mixtures of two or more simple Ottos in spirits, which, “properly blended, produce an agreeable and characteristic odour:” the names are inviting: we have *Bouquet d’Amour*, *Délices de Flora*, *Jockey Club*, *Yacht Club*, *Kew-Garden Nosegay*, etc. The odour of Lavender and the odour of Cloves mixed, *secundum artem*, we suppose, produce a new fragrance nicknamed “*Rondeletia*,” “one of the most gratifying to the smelling nerve that has ever been made.”

Among the *Dry Perfumes* are ranked *Locket powders* (perfumes put into a silk bag), *Tablets*, *Pastiles*, *Pot Pourri*, fumigation by *odoriferous resins* (the perfumes and incense of the ancients), etc.; and receipts are given for preparing the different kinds. *Perfumed Soaps* occupy a chapter: then follow *Emulsines*, *Milks*, *Emulsions*, *Cold Creams*, *Tooth-powders*, and we shall mention among the last, though not the least in importance (and a little out of our line), *Absorbent Powders*, without which “a lady’s toilet-table is not complete,” and this head includes *Rouges* and *Red-paints*. Of such we are told that many tons’ weight are used in this country; and this may very well be, seeing that a principal ingredient of the *Liquid blanc* (for theatrical use) is Oxide of Bismuth, and that Madame V—, during her stage career, consumed more than half a hundredweight as a cosmetic!

MOORE, THOMAS, F.L.S.: *The FERNS of Great Britain and Ireland*.

Edited by JOHN LINDLEY, Ph.D., F.R.S., etc. Imp. folio. Parts X. and XII. Nature-printed by Henry Bradbury. London. 1855.

This work has reached its 12th Fasciculus; the first nine of which

called *Chickweed Winter-green*; neither of them likely to yield perfumes by distillation. May not the *Gaultheria procumbens* of the United States be intended? and which is there sometimes called *Winter-green*,—of the essential oil of which an account is given by Dr. A. W. Hoffmann, and quoted by M. Piesse in the Appendix of his Work, p. 276.

have been already favourably noticed by us. The 10th Fasciculus commences with Tab. XXIX., *Lastrea Thelypteris*, which is very well represented. In the next, Plate XXX., the thickened stem and the copious fructifications of *Athyrium Filix-femina* render the figure very defective. This is acknowledged to be a cultivated specimen, and we should not consider it by any means a sample of the normal form of this species,—itself indeed very variable, as may be seen in the four following plates, where no less than eight varieties or forms are given, so different in aspect that one only wonders species-makers are not more united in considering several of these specifically distinct species, for it might be done with as much reason as in the *dilatata* group. Happily our author, in practice at least, takes a more correct view of things; and he very properly too places the four last of these eight states under the head of “(permanent?) monstrous forms,” especially the three last (in Tab. XXXIV.), viz. *crispum*, *depauperatum*, and *dissectum*. The history of this well-known Fern occupies no less than twelve of these imperial folio pages, and 31 varieties (!) are named and distinguished. “We must also repeat,” the author says, “in order that the truth may appear, that among herbarium specimens, in addition to those we have referred with tolerable certainty to the forms above enumerated, there are many others which could not be *satisfactorily* placed.” It would be a marvel if they could; and he asks and answers the following questions:—“Does this long series of gradations” (that is from the normal form to absolute monstrosities) “represent a species? One can scarcely imagine two compound Ferns more dissimilar than the extreme state of the *molle* and *incisum* groups, or the forms represented in our Plates XXX. and XXXI. C. Or, after all, is there in nature no such thing as a species among plants, but ever-changing varieties, or races of individuals only? etc. The deep study of Ferns would be scarcely likely to produce a decided negative to this question.” Certainly it is possible to study Ferns so as to leave the mind in inextricable doubts and difficulties; but it must be allowed that as far as regards the *Athyrium Filix-femina*, from the days of Linnæus until now, the majority of botanists have been uniform in their views of the limitation of this species. The author next, in Fasciculus 12, comes to the genus *Asplenium*, and Tab. XXXV. exhibits two species, both rare, or at least not of universal distribution, viz.:—

1. *Asplenium fontanum*, Bernh. (Polypodium, *Linn.*), Tab. XXXV. A.

—A very distinct species. It has occasioned no discussion on that head (except indeed with regard to the slight variety called *Halleri*), but in regard to the various localities given for it in Britain so much doubt and uncertainty have prevailed, that some botanists have altogether excluded it from the Flora of the British Isles. We believe we have thrown as much light on this subject as it will admit of in the last volume of this Journal (p. 340), and clearly shown that it has unquestionable right to be considered a native; and since that notice was published we have received a most obliging letter from the Rev. William Hawker (the veracity of whose locality cannot be called in question), and from which we give the following extract,—the more interesting as the same letter notes new stations for two other local Ferns:—"I had the good fortune to find the Fern in question (*Aspl. fontanum*) in the year 1852, on an old wall in my father's (Admiral Hawker's) grounds; there were about fifteen tufts of it, one of them nearly as large round as my hat. I had known of the existence of the Fern on this wall for several years, but only in 1852 commenced studying that class of botany, and then soon found out the value of my old neighbour. I think I can remember it on the wall nearly as far back as the year 1837, but, as that would take me back to ten years of age, I cannot vouch for any longer period. Mr. Borrer and Mr. Wollaston (of Chiselhurst) each paid the Fern a visit, and expressed themselves much pleased with it. I was over at my father's a few days ago (his place is only ten miles from here), and obtained some fronds for drying direct from the wall, a few of which I now have the pleasure to enclose you. I also enclose some fronds off a plant of the same species from Berlin, and some which I gathered last year on the Jura; both of these plants differ somewhat in habit from the British form of this species. You will perhaps be pleased to hear that last summer I had the good fortune to meet with two plants of *Asplenium Germanicum* in Cumberland, growing in company with *Woodsia Ilvensis* and *A. septentrionale*; I also, the year before, discovered (for the first time in the English lake-district) *Polystichum Lonchitis*; but I am not able to boast of all this without having worked 'like a horse' for it."

To the dubious list of recorded habitats of *A. fontanum* we could offer another, communicated by the Hon. Fox Strangways, in a note dated Abbotsbury, 16th January, 1856:—"I believe I can add a locality to the habitats of *Asplenium fontanum*, viz. the Falls of the

Turrit, at Ochtertyre, Perthshire, from whence I am promised specimens." As we have not heard since from our valued correspondent, it is presumed that no specimens have been communicated. This locality is of the more importance, for if correct it would be a strong confirmation of other northern ones, in Yorkshire, Northumberland, and especially Aberdeenshire, being so. The *Asplenium refractum*, a nurseryman's plant, here recorded as a new species,* to which the "Hab. ? Scotland" is surely too hastily given, had better have been omitted. The British Fern Catalogue has been too much attempted to be increased of late on equally dubious authorities.

2. *Asplenium lanceolatum*.—Mr. Moore does well in figuring the *Asplenium lanceolatum*, Tab. XXXV.B., on the same plate with *A. fontanum*; for distinct as they assuredly are, they are more nearly connected than others.

Asplenium Adiantum-nigrum, Tab. XXXVI. and XXXVII., is a species about which there has happily been little or no controversy, save in regard to the var. *acutum* (*Aspl. acutum*, Bory, *A. productum*, Lowe); and this we are happy to find united with *Aspl. Adiantum-nigrum*. Including the *acutum*, nine varieties are here recorded.

* One of the evil consequences of this is shown by the appearance in the 'Gardeners' Chronicle' of this day, March 15th, 1856, of the following advertisement:—"New British Fern.—*Asplenium refractum*, Moore. For description and plate" (unless our eyes grossly deceive us, there is no plate or figure whatever), "see March part of 'Nature-Printing.' R. Parker begs to offer the above new and distinct species, of which he possesses the entire stock. Plants forwarded, post free, on application, at 10s. 6d. each (!).—Paradise Nursery, Hornsey Road, Holloway." Thus here is a new British plant palmed upon us, which Mr. Moore notices (but certainly does not figure) under *Aspl. fontanum*, as a supposed variety of that, of dubious origin, under the name of *proliferum*, of Mr. Wollaston, "and which Mr. Moore considers so remarkably distinct, that were it not for the obscurity of its history, he would, without any hesitation, claim for it specific rank." Yet on the same page Mr. Moore goes on to say, "We are so satisfied with its distinctness, that notwithstanding its dubious history, we shall add the accompanying definition;" and here follow the name, character, and "Hab. ? Scotland." Mr. Wollaston remarks of it, in the same page, "Its having been associated with *Asplenium viride*" (for some gardener's friend had found it in Scotland), "and partaking so much of the aspect of that species as to have deceived some of our best pteridologists, is at least circumstantial evidence of its British origin." It is said to be bulbiferous, and we do not see why Mr. Wollaston's name, *proliferum*, should not be retained, or at least referred to as a synonym.



tinga, or the white forest; on the Venezuela side of the frontier it is called simply Monte Hajo, or low forest. The *Fungi* of the Caa-tinga are chiefly terrestrial, stipitate *Polypori*, growing subgregariouly, and including a good many forms with differences so slight that they are probably all reducible to four or five species. The Gapó, or periodically inundated forest, afforded me a good many species, growing chiefly on decayed wood. In the Mandiocca-Roças and Capoeiras (deserted Roças overgrown with young forest) several species occur on burnt logs, which have apparently a wide distribution in tropical America, and some of them are possibly cosmopolites. One of them, which seems to be *Polyporus sanguineus*, I have seen in similar situations all the way up from Pará, and it is generally accompanied by two sessile *Agarici*. In the whole collection the genus *Polyporus* is vastly predominant, and I think it not impossible that if I could have remained at Panuré the whole winter, I might have got one hundred species in this genus alone. The collection would have been by no means so large had I not been aided in its formation by nearly all the juvenile population of Panuré, the boys being incited to the task by presents of fish-hooks and Jew's-harps, and the girls by the beads and looking-glasses. The girls were by far the most expert in the search, having, as it would seem, more patience than the boys. Their name for *Fungus* is 'Dichthybaki' in the language of the Zucana Indians, which is spoken throughout the lower half of the Uaupés, but in the Lingoa Geral, spoken throughout the Amazon and Rio Negro, it is 'Urupé.' At the Janguaraté-cachoeira (Tiger cataract) I am told that in the height of the wet season two species of *Fungi* were eaten, and I was shown the place where they grew, which was under the shade of the Umari-trees,* such as the Uaupé Indians are accustomed to plant near their houses for the sake of the fruit; but at that time (November) no trace of the *Fungi* was visible, and I could only conjecture from the description given me that one of them was an *Agaricus* and the other something like *Fistulina*."

501. *Agaricus* (*Clitocybe*) *Vespertilio*, n. s.; pileo cyathiformi cincrascente rimoso-striato; stipite elato sursum attenuato concolori, lamellis albidis subdistantibus decurrentibus. Spruce, n. 123.

* Trees belonging to the genus *Humirium*, from whose bark a perfume is extracted, much esteemed in Brazil, and the wood used in carpentry, especially for rafters.

HAB. On the ground. Panuré. February, 1853.

Pileus $1\frac{1}{2}$ inches or more across, cyathiform, with the margin inflexed, dark cinereous, rimoso-striate. Stem 4 inches or more high, $\frac{1}{4}$ thick, smooth, attenuated upwards, of the same colour as the pileus. Gills nearly white, moderately broad, rather distant, decurrent.

Allied to *A. cyathiformis*, but a far taller species, with nearly white gills, and remarkable for its rimoso-striate pileus.

502. *A. (Clitocybe) rudis*, n. s.; pileo irregulari subcarnoso sulcato rugoso; stipite elongato torto; lamellis crassis distantibus ventricosis decurrenti-adnexus armeniacis. Spruce, n. 127.

Pileus $1\frac{1}{2}$ inches across, irregular, strongly sulcate and transversely rugose, ochraceous. Stem 4 inches high, $\frac{1}{2}$ thick, twisted, paler above, reddish-brown below. Gills broad, distant, ventricose, yellow, emarginate behind and very slightly decurrent.

This species has exactly the habit of *A. laccatus*, but is evidently a very distinct species.

503. *A. (Omphalia) smaragdinus*, n. s.; totus viridis; pileo tenui fortiter umbilicato; stipite gracili filiformi æquali; lamellis tenuibus paucis decurrentibus. Spruce, n. 8.

HAB. On the ground. Panuré.

Green. Pileus $\frac{1}{2}$ an inch across, thin, deeply umbilicate, almost infundibuliform. Stem 1 inch high, $\frac{1}{4}$ line thick, equal, smooth, attached to the soil by a few white threads. Gills moderately broad, subtriangular, distant, decurrent.

The gills of this pretty species are far thinner than in any form of *A. umbelliferus*, and the habit more delicate. There is no doubt that it is a very distinct species.

504. *A. (Omphalia) euomphalus*, n. s.; pileo umbilicato tenui striato cinereo-albido; stipite gracili sursum dilatato lineato-striato; lamellis latis decurrentibus albidis. Spruce, n. 122, 133.

HAB. On the ground. Panuré. February, March.

Pileus $\frac{3}{4}$ – $1\frac{1}{2}$ inches across, cinereous-white, deeply umbilicate, thin, striated. Stem $1\frac{1}{2}$ –2 inches or more high, dilated upwards, umber when dry, fibrillose or lineato-striate, composed of fibres. Gills broad, dirty-white, decurrent.

A beautiful species and evidently very distinct. The pileus in the dry plant is deep rufous-brown. The specimens, under the two numbers specified above, were gathered at different times, and the latter are much the largest.

505. *A. (Omphalia) hypoleucus*, n. s.; albidus; pileo umbilicato ruguloso; stipite tenui deorsum incrassato tomentoso; lamellis latiusculis decurrentibus, interstitiis venosis. Spruce, n. 4.

HAB. On trunks of trees. Panuré.

Dirty-white. Pileus $\frac{1}{2}$ of an inch broad, convex, umbilicate, wrinkled. Stem 1 inch or more high, not a line thick, smooth above, tomentose below, fixed to the wood by a few delicate threads, attenuated upwards. Gills rather broad, ventricose, decurrent; interstices veiny.

A. (Nolanea) —, Spruce, n. 119, 120, 134, 194.

Without notes or figures it is impossible to refer these to their proper species, and to describe them under distinctive names would be worse than useless. Number 134 has rather larger spores than the others: in all they are very irregular in form. The rose-spored Agarics are difficult enough to make out with fresh specimens; with dried specimens it is next to impossible to determine them.

506. *A. (Hebeloma) psamminus*, n. s.; albescens; pileo convexo glabro exsiccato rubro-fusco; stipite gracili glabro; lamellis ventricosis postice attenuato-affixis pallidis. Spruce, n. 124 (in part).

HAB. On the ground. Panuré.

Whitish. Pileus $\frac{1}{2}$ inch or more across, convex, smooth, even, red-brown when dry. Stem $1\frac{1}{2}$ inch high, $\frac{1}{2}$ a line thick, small, of the same colour as the pileus. Gills ventricose, rather broad, attenuated behind and attached to the top of the stem. Spores subreniform, $\frac{1}{3000}$ of an inch long, minutely echinulate.

There is no species in the section at all allied to it. I have placed it in a different division from *A. Panurensis* and *marasmiioides*, on account of its very different gills.

507. *A. (Naucoria) Panurensis*; pileo convexo fulvello squamoso; stipite tenui concolore fibrilloso; lamellis latis adnatis e sporis fulvescentibus. Spruce, n. 124 (in part).

HAB. On the ground. Panuré.

Pileus 1–2 inches across, convex, tawny, speckled with darker, adpressed, minute, triangular scales. Stem 1 inch high, 1 line or more thick, of the same colour, stringy, fibrillose, solid. Gills broad, adnate, bright tawny from the spores. Spores $\frac{1}{4000}$ of an inch long, broad, subcymbiform, very obscurely echinulate.

This and *A. marasmiioides* form a distinct group allied to *A. cerodes*, etc. This is far the most robust of the two.

508. *A. (Naucoria) marasmiioides*, n. s.; pileo convexo subconico fulvo pulverulento; stipite gracili spadiceo glabro; lamellis latiusculis postice emarginatis. Spruce, n. 116.

HAB. Attached to fragments of wood. Panuré.

Pileus $\frac{1}{2}$ an inch or more across, convex, subconical, tawny, clothed with abundant raised particles. Stem $1\frac{1}{2}$ inch high, not a line thick, deep brown. Gills subventricose, emarginate behind and adnate, tawny. Spores oblong, $\frac{1}{4000}$ of an inch long, minutely echinulate.

This species at first sight looks like one of the tawny *Marasmii*.

509. *A. (Crepidotus) Alpinia*, n. s.; pileo resupinato reniformi cinereo-tomentoso; stipite brevissimo demum obsoleto pulverulento; lamellis angustis purpurascens in centro concurrentibus, acie pallidâ. Spruce, n. 114.

HAB. On dead stems of *Alpinia aromatica*. Rio Negro.

Pileus $\frac{1}{2}$ an inch or more broad, resupinate, cinereous, finely tomentose. Stem extremely short, at length vanishing, pulverulent. Gills purplish-umber when dry, with a pale edge extremely narrow, nearly free. Spores $\frac{1}{4000}$ of an inch long, elliptic or subcymbiform, brown.

A very distinct and neat species. The rudimentary subsistent stem gives it somewhat the air of the Borneo *A. columellifer*, B. The gills are not spiculate as in some allied species.

510. *Parvulus viridis*, n. s.; totus viridis; pileo ex umbilicato subinfundibuliformi tomentoso; stipite rugoso; lamellis crassis decurrentibus. Spruce, n. 3.

HAB. On the ground in woods.

Green. Pileus 1 inch across, subinfundibuliform clothed with short down. Stem short, blunt, $\frac{1}{3}$ of an inch high, 2 lines thick, wrinkled. Gills decurrent, thick, irregular, rugose. Spores white, oblong, $\frac{1}{3000}$ of an inch long. Sometimes the stem is longer and not one-third as thick.

511. *P. retarius*, n. s.; pileo convexo leviter umbilicato subtiliter tomentoso; stipite e mycelio expanso oriundo; lamellis angustis decurrentibus ramoso-reticulatis. Spruce, n. 118.

HAB. On sandy soil. Panuré. March, 1853.

Pileus convex, $\frac{1}{2}$ an inch or more across, umbilicate, finely downy. Stem 1 inch or more high, equal or dilated above, $\frac{1}{2}$ –1 line thick, smooth. Gills narrow, decurrent, branched and reticulated.

I have no notes as to the colour of this species, which is highly

curious. The hymenium resembles that of a *Marasmius*. Numbers 108, 110, are allied species, but indeterminable without notes.

* *Hygrophorus nitens*, Sow. (sub *Agarico*), tab. 71.

HAB. On the ground. Panuré. February, 1853.

The specimens are scarcely satisfactory, but the change of colour from pure white to deep red-brown is so striking, that I am inclined to think the species either identical or closely allied.

512. *H. siparius*, n. s.; coccineus; pileo e convexo umbilicato furfuraceo-velutino; stipite elongato valido glabro; lamellis decurrentibus. Spruce, n. 130.

HAB. On the ground. Panuré.

Scarlet. Pileus $\frac{3}{4}$ of an inch across, convex, at length umbilicate, clothed, except at the edge, with a dense furfuraceo-villous coat. Stem 2 inches high, $\frac{1}{4}$ of an inch thick, smooth, nearly equal. Gills truly decurrent.

Closely allied to *H. miniatus*, but a stouter and more robust plant, with truly decurrent gills, and a very decided dense furfuraceous coat. There is another species with a furfuraceous pileus, which may possibly be a form of *H. miniatus*: there is however only a single specimen, Number 98.

* *Cantharellus cibarius*, Fr. Ep. p. 365. Spruce, n. 121.

HAB. On sandy ground in woods. Panuré. March, 1853.

513. *C. pusio*, n. s.; albescens; pileo infundibuliformi striato pulverulenti-flocculento; stipite sursum dilatato; plicis angustissimis decurrentibus, interstitiis sublævibus. Spruce, n. 94.

Whitish. Pileus $\frac{1}{3}$ of an inch across, infundibuliform, thin, striate, sprinkled with little flocculent specks. Stem 1 inch high, $\frac{1}{3}$ of a line thick, brownish when dry, pulverulent, dilated above. Folds very narrow, obtuse, entire, decurrent. Interstices even.

514. *Helionomyces Sprucei*, n. s.; pileo umbilicato umbrino, radiis pallidis antice furfuraceis picto; stipite brevi sursum dilatato fibrilloso pallido; lamellis decurrentibus distantibus pileo concoloribus; interstitiis lævibus. Spruce, n. 91.

HAB. On sticks. Panuré.

Pileus $\frac{3}{4}$ of an inch across, umbilicate, deep umber, painted with paler lines, which are furfuraceous in front. Stem pale, $\frac{3}{4}$ of an inch high, not $\frac{1}{2}$ a line thick, incrassated above, rough with little fibres. Principal gills about twenty. Interstices even, dark like the pileus, shortly decurrent.

The gills are more in number and darker than in *H. elegans*, Lév., and the whole habit different.

* *Marasmius plectophyllus*, Mont. Ann. d. Sc. Nat. sér. iv. vol. i. p. 111. Spruce, n. 113.

HAB. On wood. Panuré.

Distinguished at once from allied species by its short farinose or furfuraceous stem.

515. *M. hædinus*, n. s.; pileo campanulato albo opaco, centro umbilicato venoso-rugoso, margine crenato; stipite pallide umbrino strigoso-affixo; lamellis paucis angustis, interstitiis latissimis ut plurimum lævibus. Spruce, n. 31.

HAB. On dead leaves. Panuré. March, 1853.

White or cream-coloured. Pileus 1 inch across, campanulate, umbilicate and venoso-rugose in the centre, marked with radiating lines; margin crenate. Stem short, umber, smooth, fixed by strigose threads, 1 inch high, not a $\frac{1}{4}$ of a line thick. Gills about ten, narrow, with smooth, broad interstices.

An extremely elegant species; the pileus has an opaque aspect resembling that of kid-leather.

516. *M. leoninus*, n. s.; pileo campanulato e centro striato rugoso fulvello; stipite gracili pallide umbrino; lamellis latis distantibus adnatis; interstitiis rugosis. Spruce, n. 112.

HAB. On dead leaves in woods near Panuré. March, 1851.

Pileus 1 inch or more across, campanulate, tawny, striated with paler lines from the centre, rugose. Margin more or less toothed. Stem $1\frac{1}{2}$ –2 inches high, $\frac{1}{2}$ a line thick, pale umber, opaque, adhering by a few strigose threads, even, scarcely striate. Gills pale, distant, moderately broad, adnate.

One of the finest species of the genus, of a beautiful pale tawny tint, with an elegantly sculptured pileus.

517. *M. rhabarbarinus*, n. s.; pileo convexo membranaceo rhabarbarino; stipite elongato filiformi glabro obscuriori, basi strigosa affixo; lamellis paucis pallidis subvenosis. Spruce, n. 140.

HAB. On dead leaves. Panuré. March, 1853.

Pileus $\frac{1}{2}$ an inch or more across, campanulate, membranaceous, tawny, sometimes reticulated from the contraction of the external membrane. Stem filiform, 1 inch or more high, $\frac{1}{4}$ of a line thick, paler than the pileus, fixed by radiating strigose tawny threads. Hymenium pale. Gills venose. Interstices sometimes wrinkled.

518. *M. tageticolor*, n. s.; pileo membranaceo umbonato puniceo spadiceove radiis luteis picto, margine lato dentato; stipite tenui pallido opaco; lamellis paucis luteis ventricosis postice attenuato-liberis. Spruce, n. 37. (TAB. V. fig. 1.)

HAB. On dead twigs, stipules, etc. Panuré.

Pileus 2-8 lines across, convex, membranaceous, umbonate, varying from reddish-brown to deep crimson, adorned with from eight to ten yellow rays, very minutely wrinkled. Stem 1-1½ inch high, setiform, opaque, pale umber. Gills narrow, ventricose, attenuated behind and free, yellow like the rays. Interstices very broad, even.

Nothing can be conceived more exquisite than the colouring of this species, which appears to be pretty common. It has the rich tints of the African Marigold. (TAB. V. fig. 1. *M. tageticolor*, nat. size.)

* *M. fulvus*, Mont. MSS. Coll. Lep. n. 1080. Spruce, n. 104.

HAB. Panuré.

The only specimen is paler than the plant of Montagne, but it is, I believe, the same thing. In both the gills are almost too thin for the genus *Marasmius*.

519. *M. helvolus*, n. s.; pileo campanulato helvolo sublævi, margine undulato; stipite fusco insititio, basi non strigosa; lamellis paucis ventricosis adnexis; hymenio pallido. Spruce, n. 139.

HAB. On dead leaves.

Pileus ½ an inch or more across, campanulate, rufous, tawny, nearly uniform in tint, even; margin waved. Stem 1 inch or more high, filiform, brown, striate, not fixed by strigose threads. Hymenium pale. Gills few, ventricose, adnexed.

Allied to *M. rhabarbarinus*, but differing in the darker stem, which is adfixed by strigose threads, and other points.

* *M. ferrugineus*, B., Lond. Journ. Bot. vol. ii. p. 630. Spruce, n. 90.

HAB. On dead leaves. Panuré. March, 1853.

* *M. fulviceps*, B., Lond. Journ. Bot. vol. vi. p. 490. Spruce, n. 100, 92.

HAB. On decayed trunks. Panuré. March, 1853.

520. *M. flammans*, n. s.; pileo membranaceo aurantio-fulvo e centro lineis pallidioribus picto; lamellis ochraceis angustis postice attenuatis attingentibus; stipite filiformi pallide fusco lævi. Spruce, n. 97.

HAB. On dead leaves. Panuré.

Pileus 1 inch across, membranaceous, bright orange-tawny, painted with paler lines radiating from the centre; margin waved. Stem 2 inches high, $\frac{1}{4}$ of a line thick, smooth, filiform, pale brown, scarcely striated. Gills about twenty, exclusive of the shorter ones, ochraceous, narrow, attenuated behind. Interstices nearly even.

521. *M. pœcilus*, n. s.; pileo campanulato fulvo; stipite umbrino insititio; lamellis flavis ventricosis adnexis; interstitiis lævibus fulvis. Spruce, n. 139.

HAB. On dead leaves in woods. Panuré. February, 1853.

Pileus campanulate, $\frac{1}{3}$ of an inch across, tawny, rarely radiated with yellow. Stem setiform, $1\frac{1}{2}$ inch high, umber, springing, for the most part abruptly, from the matrix. Gills ventricose, yellow. Interstices smooth, tawny, red.

This species is distinguished from *M. helvolus* by Mr. Spruce in his notes, and is certainly as worthy of distinction as most of the allied species.

* *M. hæmatocephalus*, Mont.

HAB. On dead twigs. Panuré.

A small form, n. 78, with a rose-coloured pileus, and pale ventricose gills, on leaves of some species of *Icica*, appears to belong to the same species.

* *M. atrorubens*, B., Lond. Journ. Bot. vol. i. p. 138. Spruce, n. 105, 101, 106.

HAB. Amongst dead leaves and branches. Panuré. March, 1853.

* *M. decurrens*, Mont., Ann. des Sc. Nat. sér. iv. vol. i. p. 118. Spruce, n. 107.

HAB. On dead twigs. Panuré. An abundant species. March, 1853.

522. *M. Caatingensis*, n. s.; albescens; pileo e convexo plano-depresso striato-picto; stipite subfusco sursum pulverulento flocculoso; lamellis angustis decurrenti-adnexis. Spruce, n. 85, 86, 87, 95.

HAB. On the ground in Caatingas (scrubby woods), near the River Uaupés. March, 1853. A common species.

Pileus $\frac{1}{4}$ – $\frac{3}{4}$ of an inch across, at first convex, then plano-depressed, beautifully striate. Stem 1 – $1\frac{1}{2}$ inch high, $\frac{1}{4}$ of a line thick, brownish, sprinkled above with little flocculent specks. Gills narrow, distant, decurrenti-adnexed.

This species is closely allied to *M. Brasiliensis*, Mont. et Berk., but the gills in that species are truly decurrent.

523. *M. dilatatus*, n. s.; pileo e campanulato plano-depresso; stipite fusco subpulverulento sursum dilatato; lamellis angustis numerosis decurrenti-adnexis subremotis. Spruce, n. 93, 109.

HAB. On dead branches. Panuré.

White. Pileus $\frac{1}{3}$ — $\frac{1}{2}$ an inch across, conico-campanulate, at length plano-depressed, thin, membranaceous, striated, smooth. Stem 1 inch high, not $\frac{1}{4}$ of a line thick, brown, slightly pulverulent, with sometimes a little matted mycelium at the base. Gills very numerous, narrow, decurrenti-adnexed, all ending together, so as to leave a pale space at the dilated top of the stem.

524. *M. omphalodes*, n. s.; pileo plano umbilicato albido, centro umbrino, primum squamuloso, glabrescente; stipite elongato subtiliter furfuraceo-tomentoso; lamellis angustis decurrentibus. Spruce, n. 131.

HAB. On fragments of dead vegetables. Panuré. February, 1853.

Pileus $\frac{1}{2}$ —1 inch broad, plane, umbilicate, thin, dirty white, umber-brown in the centre, at first squamulose. Stem 2 inches or more high, $\frac{1}{2}$ —1 line thick, furfuraceo-tomentose, brown, dilated above. Gills narrow, decurrent, liver-brown when dry.

This species is just intermediate between *Marasmius* and *Omphalia*. The furfuraceous stem resembles rather *Marasmius* than analogous Agarics.

525. *M. pulchellus*, n. s.; pileo campanulato sublævi; stipite rufo pulverulento; lamellis confertis angustis adnatis. Spruce, n. 99.

HAB. On dead leaves. Panuré.

Pileus $\frac{1}{2}$ an inch across, campanulate, slightly striate. Stem 1—2 inches high, setiform, rufous or brown, pulverulent. Gills numerous, crowded, narrow, adnate, with occasionally a slight decurrence.

Allied to *M. insititius*, but distinguished by its more even pileus, and more crowded, narrow gills.

526. *M. cladophyllus*, n. s.; pileo convexo hepatico rugosiusculo; stipite filiformi fusco basi strigosa affixo, lamellis ventricosis latiusculis ochraceis ramoso-reticulatis. Spruce, n. 89.

HAB. On dead leaves. Panuré.

Pileus $\frac{1}{2}$ of an inch across, convex, liver-brown, slightly rugose. Stem 3 inches high, brown, smooth, fixed by a few strigose threads. Gills rather broad, ochraceous, ventricose, joined by transverse branched processes nearly as broad as themselves.

527. *M. pileuleus*, n. s.; candidus; pileo umbilicato tomentoso;

stipite brevi farinoso e strato ceraceo-fibroso oriundo; lamellis paucis adnato-decurrentibus.

HAB. On dead sticks. Panuré, and at foot of Mount Cocui.

White. Pileus 1 line across, umbilicate, clothed with a close-pressed, matted down. Stem $1\frac{1}{2}$ –2 lines high, $\frac{1}{4}$ of a line thick, pulverulent, springing from a corticioid mass, which runs over a few fibres. Gills few, adnate, decurrent.

528. *M. nivosus*, n. s.; niveus; pileo umbilicato sulcato; stipite brevi adscendenti pulverulento-tomentoso; lamellis paucis decurrenti-adnatis obtusis.

HAB. On sticks, fern, etc. Foot of Mount Cocui and Panuré.

White. Pileus 2 lines broad, deeply umbilicate and sometimes umbonate, sulcate, opaque, obscurely tomentose; border arched. Stem short, $\frac{1}{3}$ of an inch high, not $\frac{1}{2}$ a line thick, ascending, dilated above, tomentose, springing from a little round patch of mycelium. Gills ten to twelve, decurrenti-adnate, extremely obtuse, sometimes forked.

Allied to *M. epileucus*, but perfectly distinct.

529. *M. obscurus*, n. s.; pileo convexo demum plano e brunneo olivaceo-subluteo; stipite subrufo, tenui; lamellis paucis lato-adnatis albidis. Spruce, n. 138.

HAB. On dead leaves. Panuré.

Pileus at first brownish, convex, then yellowish-grey, plane, 1 line across. Stem $\frac{1}{3}$ – $\frac{1}{2}$ inch high, filiform, rufous, pulverulent below, sometimes springing from an Himantoid mycelium. Gills about ten, whitish, broadly adnate.

This is an obscure species, but the characters are sufficiently marked to distinguish it from others.

530. *M. bellus*, n. s.; pileo planiusculo pallido reticulato-rugoso; stipite elongato gracili e mycelio contexto oriundo; lamellis tenuibus distantibus; interstitiis reticulatis. Spruce, n. 102 (var.).

Pileus 1 inch across, pale tan, plane, slightly umbilicate, reticulato-rugose. Stem 2 inches high, $\frac{1}{4}$ of a line thick, dark brown, smooth, springing from a closely matted mycelium. Gills moderately broad, distant, attached to the top of the stem. Interstices reticulate.

Another form, as it appears, has the lower part of the stem opaque and pale umber-brown. The only specimen is however too bad to say much about it.

531. *M. Hippiochates*, n. s.; pileo convexo sulcato coccineo; lamellis

pallidis adnatis; stipite longissimo nigrescente apice pallido, hic illic noduloso prolifero. Spruce, n. 88.

HAB. On wood, stalks, etc., in forests on the River Uaupés. March, 1853.

Pileus $1-1\frac{1}{2}$ line across, hemispherical, sulcate, scarlet. Stem 4-5 inches high, extremely slender, rigid, shining, pale at the apex, gradually becoming darker downwards, and at length black, interrupted here and there by joint-like knots, occasionally giving off towards the apex branches, which are again branched, principally on the upper side, and terminated by a minute pileus. Gills few, pale, adnate.

Allied to *M. hæmatocephalus*, but a smaller species, and remarkable for its ramification. Its nearest ally is *M. polycladus*, Mont., from which it differs in its pale gills.

532. *M. cupressiformis*, n. s.; stipite communi longo setiformi nigrescente sursum prolifero-racemoso, ramulis divaricatis; pileis candidis sulcatis umbilicatis; lamellis paucis concoloribus collariatis. Spruce, n. 75. (Tab. V. fig. 3.)

HAB. On dead leaves. Panuré.

Stem $3\frac{1}{2}$ inches high, setiform, attenuated upwards, at length black, sulcate; branched about one-half or one-third from the base. Ramuli divaricate, then curved upwards, about 2 lines long, each bearing a pileus. Pilei convex, white, sulcate, umbilicate, with a dark process from the centre of the umbilicus, as if the stems ran quite through the pileus; below the gills, at some distance, there is a little projection, as if a new stem had arisen at that point. Gills white, fixed to a common collar.

A very elegant production. (Tab. V. fig. 3. *M. cupressiformis*, natural size, with pileus magnified.)

533. *M. populiformis*, n. s.; stipite communi longo setiformi aureo sursum racemoso; pileis convexis fuscis paucisulcatis; lamellis 5-6 concoloribus. (Tab. V. fig. 2.)

HAB. On dead twigs, etc. Panuré.

Stem 4 inches high, setiform, much attenuated upwards, golden-yellow, branched in a racemose manner above; branches set on at an angle of about 60° , then curved upwards, 1-3 lines long, each bearing a pileus. Pileus $\frac{1}{3}$ of a line across, brown, with five or six furrows. Gills of the same colour.

Much resembling *M. cupressiformis*, but differing altogether in co-

lour, and somewhat in appearance, as the branches are more confined to the apex. The uncoloured figure is insufficient to express the difference. (Tab. V. fig. 2. *M. populiformis*, natural size, with the pileus magnified.

534. *M. coilobasis*, n. s.; totus albus; pileo convexo membranaceo; stipite e disco orbiculari centro depresso oriundo; lamellis angustis linearibus; interstitiis venosis. Spruce, n. 1.

HAB. On dead trunks. Panuré.

Pileus $\frac{3}{4}$ –1 inch across, convex, smooth, white, membranaceous. Stem $\frac{3}{4}$ –1 inch high, not $\frac{1}{2}$ a line thick, smooth, springing from an orbicular disc, which is hollowed out in the centre. Gills narrow, linear. Interstices veined.

The disc from which the stem springs calls to mind *Agaricus platypus*, but the other characters are very different.

* *Lentinus villosus*, Fr. Ep. p. 388. Spruce, n. 128.

HAB. On decayed wood. March, 1853. Panuré. San Carlos del Rio Negro. April, 1853.

* *L. fumigatus*, Lév., Ann. d. Sc. Nat. Sér. iii. vol. v. p. 117. Spruce, n. 129.

HAB. On dead wood. Panuré.

535. *L. Nicotiana*, n. s.; pileo umbilicato tabacino squamis pallidis contextis variegato; stipite adscendente pallido rigido-squamoso; lamellis lilacinis decurrentibus basi furfuraceis. Spruce, n. 45. (Tab. V. fig. 7.)

HAB. On decayed trunks. January. Panuré.

Pileus 2 inches across, deeply umbilicate, brown, variegated with subtriangular, pale and patent scales, which are composed of close-set flocci. Stems ascending, irregular, pale, connate, rough with a few furfuraceous rigid scales. Gills lilac, denticulated, decurrent, very narrow below, where they are clothed with furfuraceous pubescence, so as to have the appearance of ending abruptly.

The pileus has much the colour of that sort of tobacco (bird's-eye) which is variegated with paler patches. The gills are described by Mr. Spruce as lilac when fresh; in the dried plant they are greyish. (Tab. V. fig. 7. *L. Nicotiana*, nat. size.)

* *L. Lecomtei*, Fr. Ep. p. 388. Spruce, n. 135.

HAB. On decayed wood. March, 1853. Panuré.

536. *L. calvescens*, n. s.; pileo ex umbilicato subinfundibuliformi

pallido primum villosa, demum calvescente; margine lobato; stipite brevi nudo; lamellis subdistantibus longe decurrentibus latiusculis, acie tenui subintegra. Spruce, n. 136.

HAB. On decayed trunks of trees. February, 1853. Panuré.

White. Pileus 3 inches across, thin, umbilicate, subinfundibuliform, at first clothed (at least in the centre) with long, tow-like hairs, then quite smooth, striate; margin lobed and crenate; sometimes however nearly entire, and fissured in the direction of the gills. Stems $\frac{1}{2}$ –1 inch high, 2 lines thick, often connate, nearly naked. Gills rather distant, broadish, decurrent, but not ending abruptly; edge very thin, entire, or only a little uneven; not regularly denticulate.

The distinctive character of this species, of which I have seen many specimens, is the change in the nature of the surface which takes place with age.

The surface of the pileus, indeed, resembles that of *Lentinus subnudus*, but the gills in that species are closer and thinner.

* *L. tener*, Kl. MSS.

HAB. On decayed wood with *L. villosus*, from which its strongly glandular gills at once distinguish it.

537. *Panus reticulatus*, n. s.; pileo plano depresso fuligineo reticulato, stipite gracili concolore; lamellis pallidis angustis confertis breviter decurrentibus postice reticulatis. Spruce, n. 130.

HAB. On the ground amongst leaves, etc. March, 1853. Panuré.

Pileus $\frac{1}{3}$ – $\frac{3}{4}$ of an inch across, plano-depressed, dingy, more or less sometimes very strongly reticulated; thin. Stem of the same colour as the pileus, 1–2 inches high, 1 line or more thick, smooth. Mycelium white, forming little tooth-like bristles. Gills narrow, close, at first obtuse, anastomosing behind. Spores (if really belonging to the species) globose, strongly echinulate, $\frac{1}{3500}$ of an inch in diameter.

This is a very curious species, approaching the genus *Cantharellus*. I regret that I have not sufficient materials to say more about it.

538. *P. Sprucei*, n. s.; pileo excentrico flabelliformi striatim subrugoso livido siccitate albescente, margine lobato; stipite brevi compresso; lamellis subdistantibus nigris decurrentibus postice cum stipite subtiliter tomentosis integris. Spruce, n. 74. (Tab. V. fig. 6.)

HAB. On decayed wood. Panuré.

Pileus $1\frac{1}{2}$ inch long, 2 inches broad, depressed behind, flabelliform, lobed, livid, whitish when dry, opaque from very minute matted down,

marked here and there with little raised lines. Stem confluent with the pileus, compressed, short, minutely tomentose, attached by an irregular disc, which is rough with little gill-like processes. Gills dark brown or black, moderately broad and distant, entire, decurrent, thin; base clothed like the stem.

On a larger scale than *P. dealbatus*, and of a less pure white when dry. *Panus Vriesii* and *P. melanophyllus* are allied but distinct species. The little elevations at the base are not, I think, entirely dependent on the inequalities of the matrix. (Tab. V. fig. 6. *P. Sprucei*, nat. size.)

* *Schizophyllum commune*, Fr. Ep. p. 403. Spruce, n. 137.

HAB. Abundantly in recently cleared ground throughout the Rio Negro and Uaupés districts.

* *Lenzites applanata*, Fr. Ep. p. 404. Spruce, n. 66 (junior).

HAB. On dead trunks. Jauaraté-cachoeira. February, 1853.

* *L. deplanata*, Fr. Ep. p. 404. Spruce, n. 65, 59.

HAB. On dead trunks. Jauaraté-cachoeira. October, 1852. Marginal zones slightly tawny.

* *L. striata*, Fr. Ep. p. 406. Spruce, n. 132.

HAB. Very frequent on half-burnt logs in roças on the Rio Negro and Uaupés.

539. *Polyporus* (Mesopus) *augustus*, n. s.; pileo orbiculari crassiusculo coriaceo suberoso, profunde umbilicato, crebri-zonato, rugoso, umbrino albo-variegato; stipite valido umbrino, epidermide crustacea; hymenio primum plano, sicco concavo, albo, poris minutis punctiformibus. Spruce, n. 211.

HAB. On a dead branch. January, 1853. Panuré.

Pileus 10 inches across, orbicular, coriaceo-suberose, moderately thick, convex, with a broad umbilicus, marked all over with radiated wrinkles and very numerous zones, umber, variegated with white; substance white. Stem 5 inches high, rather uneven, slightly incrassated upwards, 1 inch thick. Hymenium white, plane when fresh, concave when dry. Pores minute, $\frac{1}{150}$ of an inch across, punctiform.

This most magnificent species resembles *Pol. sacer*, from which it differs in its more frequently-zoned, rugose pileus, its smooth not velvety stem, and its minute pores. Only a single specimen appears to have been found.

540. *P.* (Mesopus) *camerarius*, n. s.; pileo crassiusculo rigido pul-

vinato in mesopodibus umbilicato opaco umbrino zonis crebris picto subintegro; stipite elongato irregulari pileo obscuriore pruinoso; hymenio concavo albo; poris punctiformibus contextu pallido zonato. Spruce, n. 171, 197.

HAB. On dead trunks. Panuré. March, 1853.

Pileus 2-4 inches across, pulvinate, umbilicate when central, rather thick, hard, rigid, opaque, dull pale umber, with numerous darker zones nearly even. Stem 2-7 inches high, $\frac{1}{4}$ — $\frac{1}{8}$ of an inch thick, pruinose, more tawny than the pileus. Hymenium white, concave. Pores punctiform, ending abruptly.

The lateral individuals (197) are larger, but there is no real difference. It is a very beautiful species; edge not grooved. The mesopod specimen was included in n. 194.

(To be continued.)

Definitions of Rare or hitherto Undescribed AUSTRALIAN PLANTS, chiefly collected within the boundaries of the Colony of Victoria; by DR. FERDINAND MUELLER, Government Botanist for the Colony of Victoria.

(Continued from p. 72.)

XXV. LORANTHACEÆ.

96. *Loranthus* (Sect. *Dendroptlthoë*) *canus*, F. Muell.; squarrose, grey-lepidote; branchlets below terete; leaves alternate, petiolate, long-lanceolate, more or less falcate, nearly blunt, generally three-nerved, indistinctly veined; cymes axillary, with only two branchlets, bearing each three flowers; flowers pentamerous, outward grey-lepidote, the intermediate one sessile, with an oblong bracteole, the lateral ones on a short and thick pedicel, with a roundish navicular bracteole; calyx five-toothed, as well as the bracteoles ciliolate; anthers linear, affixed with the base; style filiform; berries urceolate-ovate, greyish-yellow, succulent.

HAB. Along the Mackenzie Creek at the Grampians, on the Buffalo Creek, and the Upper Ovens, parasitical on *Acacia mollissima*; at both of those localities rare.

I regret not having been able to examine well-developed flowers of this plant. The leaves are not unlike those of *L. pendulus* (*L. Miquelii*,

Lehm.) and *L. eucalyptoides*. The fruits offer very decisive marks of distinction amongst the numerous species; thus they are in *L. canus* more succulent, shorter, and with a less contracted border, and not of a greenish-brown colour, as in *L. pendulus*. In *L. Preissii* the berries are pink, spherical, and of the size of a pea; in *L. Exocarpi* black, large, ovate; in *L. eucalyptoides* oblong, pear-shaped, green, with a yellowish top. All the described species require a careful new disquisition, as they are not only parasites of various plants similar to each other, but also of genera of very different Natural Orders. Thus *L. eucalyptoides* produces, as long as it adheres to *Eucalypti* or *Casuarinæ* (or now also to *Virgilia Capensis*), long falcate leaves, which, when the plant receives its nourishment from *Banksia integrifolia*, assume an ovate-orbicular shape, and a very fleshy consistence, whilst the flowers become sessile.

On a former occasion I alluded to the singular circumstance that the genus should be foreign to Tasmania; although it is here not only amply represented, but also reaches the shores of Wilson's Promontory, and exists in New Zealand.

XXVI. CAPRIFOLIACEÆ.

97. *Sambucus xanthocarpa*,* F. Muell.; arboreous; leaves pinnately three- or five-foliolate or bipinnate, smooth, without stipules; leaflets lanceolate or ovate-lanceolate, long-acuminate, with exception of the basis sharp-serrated; cymes with five or seven principal branches; flowers three- or rarely four-parted; berries yellow, three-seeded.

HAB. On the shady moist banks of the Brodribb, Snowy, and Cabbage-tree Rivers.

A tree with the habit of the common Elder, and perhaps of equal utility.

XXVII. RUBIACEÆ.

98. *Diodia* (Sect. *Eudiodia*) *reptans*†, F. Muell.; perennial, herbaceous, much branched; stems rooting; leaves ovate, acutish, petiolate, glabrous or covered with short stiff hair, always ciliate; stipular va-

* *Tripetalus Australasicus*, Lindl.

† This is not a *Diodia*, but a *Nertera*, or closely allied plant, very similar to *N. setulosa*, Hook. fil. (Fl. N. Zeal. i. 112. t. xxviii. B.), agreeing with this plant in the slender corolla, but differing in the two-lipped calyx. The generic character of *Nertera* should be modified to include several plants, chiefly differing in the structure of the calyx-lobe.

gina truncate, with or without short bristles; flowers axillary and terminal, solitary, on very short peduncles, not opposite to each other; tube of the corolla very thin, much longer than the bidentate limb of the calyx; stamens and style exserted, the latter divided nearly to the base, its divisions capillary; fruits ovate, tapering into the base, nearly glabrous, crowned by the twice or three times shorter, deltoid, acuminate, ciliate, nearly erect teeth of the calyx.

HAB. Mountain pastures, and plains along the Snowy River.

One of the most southern localities of a tribe of plants, which abounds within the tropics. *Nertera depressa* shares its localities.

Its nearest related congener seems to be *Diodia Virginica*.

99. *Galium* (Sect. *Leioparane*) *geminifolium*, F. Muell.; somewhat scabrous, otherwise smooth; stems long, flaccid, decumbent, with dichotomous branches; leaves remote, linear, acutish, one-nerved, reflexed on the margin, rarely four developed in a whorl, generally two of them wanting or reduced to a tooth-shaped stipule; flowers hermaphrodite, panicked; peduncles straight, divaricate, solitary, twin, or several together; pedicels very short; lobes of the small yellowish corolla lanceolate-ovate, much longer than the stamens; fruits glabrous, densely dotted.

HAB. Along the margin of the Murray and Avoca.

This insignificant herb may be considered a valuable acquisition to the botanical system, inasmuch as it furnishes means of ascertaining the true nature of the stipular leaves in *Stellatæ*, proving apparently that this tribe cannot be separated by natural characters from the Rubiaceous Order.

XXVIII. COMPOSITÆ.

100. *Erigeron conyzoides*,* F. Muell.; perennial, smooth, somewhat glabrous; stem erect, herbaceous, leafy, below simple; lower leaves lanceolate, tri-nerved, tapering into a long petiole, remotely and sharply serrulate, upper ones broad-linear, acute, quite entire, sessile; flower-heads panicked, hemispherical or campanulate; scales of the involucre linear-subulate, somewhat scabrous on the back; female flowers extremely narrow, whitish, flat, little longer than the disc; achenia compressed, oblong, scantily hairy, hardly half as long as the pappus.

HAB. Sources of the Murray and Snowy Rivers (4-5000 feet).

101. *Calotis* (Sect. *Eucalotis*) *glandulosa*, F. Muell.; pubescent from

* Scarcely differing from *E. Bonariensis*, L.—ED.

gland-bearing hair; rhizome divided, somewhat woody; stems numerous, procumbent or adscendent, leafless at the summit; leaves obovate or oblong-cuneate, the uppermost sessile, the rest tapering into a petiole, beyond the middle toothed or lacinate; scales of the involucre ovate-lanceolate, glandulous-pubescent; achenes ovate-cuneate, very strongly compressed, deep brown, glabrous, asperous, with a thin margin; awns four to seven, setaceous, unequal in length at the apex, retro-aculeate, scabrid at the base, alternating with an equal number of oblong or obovate-cuneate scales, which are ciliate at the top.

HAB. On dry grassy ridges near the Snowy River and its tributaries, towards Maneroo. The colour of the ray is blue, as in *C. cuneifolia*, *lasiocarpa*, and *dentex*. This character is not without importance for distinguishing the various species. Thus *C. dilatata*, *anthemoides*, *scapigera*, and *scabiosifolia* have whitish radial flowers; *C. microphylla*, *Muellerii*, *multiseta*, *erinacea*, and *lappulacea*, yellow ones. Those of *C. (Cheiroloma) hispidula*, *cymbacantha*, and *breviseta*, are yet to be observed.

The genus *Cheiroloma* may be referred as a fifth section to this genus.

102. *Calotis* (Sect. *Acantharia*) *anthemoides*, F. Muell.; smooth; root fibrous, producing runners; stems simple; radical leaves on long petioles, pinnately divided, the lower segments linear, entire, the rest pinnately cut into linear-acute divisions; leaves of the stem small, remote, sessile, lanceolate, entire or rarely toothed; scales of the involucre few, disposed in two rows, ciliate, but smooth on the back, outer ones almost round; achenia cuneate, a little compressed, margined and broadly winged, with exception of the tops, even and smooth; awns generally eight, valid, retro-hispid, alternately very short, and of the length of the achenium.

HAB. In muddy localities in the neighbourhood of Station Peak.

A singular plant, differing from the rest of the species, as well in habit as in the hermaphrodite flowers of the disc. Ray whitish.

103. *Brachycome leptocarpa*, F. Muell.; annual; leaves linear-cuneate, as well as the branches covered with articulate hair, at the upper end cut or pinnatifid, their teeth or segments acute; peduncles naked, filiform, upwards smooth; scales of the involucre blunt, glabrous; achenia cuneate-linear, compressed, pale brown, with naked margin, on both sides hairy-scabrous; pappus conspicuous.

HAB. In low grass-land, not unfrequent in the colony of Victoria, as well as in South Australia. Similar to *B. debilis*.

104. *Brachycome ptychocarpa*, F. Muell.; annual, glabrous; scapes filiform, generally naked; leaves pinnatisected, with linear-acute segments; scales of the involucre blunt, ciliolate; achenia very small, brown, surrounded by a ciliolate wing, on both sides with three hairy-scabrous ribs, the middle rib more prominent; pappus minute.

HAB. In the Buffalo Mountains.

Like the following, a small tender herb.

105. *Brachycome nivalis*, F. Muell.; perennial, herbaceous, smooth; leaves all radical, somewhat carnose, pinnatisected or rarely entire, on long petioles, their segments distant, linear, entire or pinnatipartite, acute; rachis linear; stems simple, much longer than the leaves, naked or with a solitary bractea; scales of the involucre lanceolate-oblong, with ciliate torn margins; receptacle hemispherical; achenia compressed, oblong-cuneate, with a conspicuous pappus; those of the disc very narrowly winged; those of the ray surrounded with a broad, torn membrane, on both sides slightly convex, rough towards the summit.

HAB. On the highest summits of the Australian Alps, in grassy or peaty soil; for instance, on Mount Buller and the Cobboras Mountains.

A remarkable species, often tinged with a purple hue.

106. *Brachycome multicaulis*, F. Muell.; suffruticose, somewhat scabrous; stems numerous, ascending, foliate, simple or a little branched, naked towards the summit; leaves nearly sessile, pinnatifid, their segments linear, acute, close to each other, short in the upper leaves; scales of the involucre cuneate-oblong, somewhat scabrous, blunt, with membranaceous ciliate-torn margins; receptacle convex; achenia compressed, oblong-cuneate, with a very short pappus, those of the disc with very narrow hardly ciliolate wings, those of the ray with broader somewhat callose margins, rough towards the summit.

HAB. On the highest cliffs of Mount Buller.

107. *Brachycome chrysoglossa*, F. Muell.; perennial, glandulously pubescent; leaves only on the lower part of the stem, oblong-cuneate, at the top rounded or truncate, with a few notches; scales of the involucre blunt, obovate, with a broad membranaceous torn-ciliate margin, glandulous on the back; ray golden-coloured; acheneum tawny-yellow, margined, compressed, surrounded by a broad, irregularly petinate-ciliate wing, thickened and somewhat scabrous on the disc; pappus conspicuous.

HAB. In the Mallee Scrub towards the north-western boundaries of the colony.

Remarkable for the colour of its flower-ray, otherwise closely approaching in affinity to *B. calocarpa*.

108. *Angianthus brachypappus*, F. Muell.; glomerules tapering gradually into the base, at last brownish; pappus ciliate-torn, shorter than the achenium, or producing a single hair, which is not plumose at the summit, and shorter than the corolla.

HAB. On barren plains near Swanhill.

Although the above notes appear to offer all distinctive marks between this and *A. tomentosus*, the only hitherto known species, yet this new one may be easily recognized by them.

109. *Chrysocoryne* (Sect. *Bisquama*) *tenella*, F. Muell.; dwarf; leaves thick, linear, upwards broader; glomerules short, cylindrical, blunt, golden-yellow; heads with two flowers; scales of the involucre two, glabrous, naked or but imperfectly ciliolate; corolla three-toothed, short exserted.

HAB. In flats subject to inundations by winter-rains, between the Long Lake and the Fountain, on Spencer's Gulf, *C. Wilhelmi*.

An *Olax* (*O. obcordata*), which grows conjointly with this plant, presents a similar approach to *O. Phyllanthi* from Western Australia, as this *Chrysocoryne* to *C. pusilla*.

110. *Rutidosia leiolepis*, F. Muell.; stems numerous, dwarf, simple, ascending, tomentose, rising from a woody rhizome; leaves broad-linear, with revolute margin, at last smooth, the radical ones crowded with a woolly clasping petiole; flower-heads terminal, solitary, hemispherical; scales of the involucre in several rows, pale, smooth; the outer ones broad-ovate, blunt, the inner ones lanceolate; achenia oblong-ovate, truncate; scales of the pappus eleven to thirteen, oblong-spathulate.

HAB. On rocks along the Snowy River, and near it on the bare mountainous pastures.

The subgenus established on this plant connects *Rutidochlamys* closely with *Rutidosia*.

111. *Trineuron nivigenum*, F. Muell.; leaves linear, blunt, indistinctly three- or five-nerved, on a clasping, fimbriate petiole; heads many-flowered; scales of the involucre fourteen to sixteen, oblong, with three pellucid nerves; female flowers three- or four-toothed, their style very short bilobed; style of the sterile flowers undivided; achenia indistinctly tetragonous, oblong-cuneate, with but slightly thickened angles.

HAB. On grassy or gravelly places in the Munyang Mountains, irrigated by the melting glaciers (5–6000 feet).

Intermediate between *T. spathulatum* from the Antarctic Islands, and *T. pusillum* from New Zealand.

112. *Hæckeria ozothamnoides*, F. Muell.; branches scantily woolly; leaves linear, mucronate, with revolute margin, beneath grey-tomentose; heads five- to seven-flowered; all the scales of the involucre upwards pale yellow.

HAB. In dry places on Barker's Creek, on the Upper Murray and Snowy River.

The species upon which I founded the genus originally may be briefly thus characterized:—*Hæckeria cassiniiformis*, F. Muell.; leaves semiterete, blunt, as well as the branches scabrous; heads two- or three-flowered; interior scales of the involucre upwards white.

(To be continued.)

BOTANICAL INFORMATION.

THE MAMMOTH TREE.

For a few weeks lately a portion of this truly wonderful tree (*Washingtonia gigantea* of Dr. Lindley, *Washingtonia gigantea* of the Californians, *Sequoia gigantea* of Dr. Torrey) has been privately exhibited in the great room of the Philharmonic Society, Newman-street, Oxford-street. This particular tree is the one noticed in our account of the several giants which constitute the "Mammoth-Tree Grove" (see p. 106 of our present volume). It has been stripped of its bark at great labour and expense by Mr. Trask and his assistants to a height of 116 feet from the base; and the portion at present brought over by the intelligent proprietor, Geo. L. Trask, Esq., M.A., consists of sections of the bark (from 18 to 22 inches thick!) taken from the trunk 40 feet from the base. These sections, all numbered, are placed in their proper position, and exactly represent that portion of the trunk from which they are taken, and certainly nothing of the kind has ever been seen in Europe before. The diameter is here 22 feet (at the base 30 feet). A door is formed and the interior presents a nearly circular apartment, 20 feet wide. The colour of

the bark is a rich cinnamon-brown, not unlike that of some of the varieties of the Scotch Pine in its native hills, but their colour is varied by a sprinkling of a rich golden-coloured lichen, which grows naturally on the trunk (the *Evernia vulpina*, Ach.); and, what is remarkable, the same species of Lichen is common on the trunks of Pines in Switzerland.

We believe there can be but one opinion among all who have been privileged to see this monster of the vegetable creation, viz. that it is one of the most wonderful natural vegetable productions that has ever been brought to Europe; and it is earnestly hoped the spirited proprietor will give instructions for the remainder of the bark (now at New York) to be sent over, and that he will find a place, in or about London, suited to the *public* exhibition of the entire length (116 feet), as well as the entire base. The whole tree, still standing and living in its native mountains, measures 327 feet in height, and the circumference is 90 feet!

NOTICES OF BOOKS.

GÉOGRAPHIE BOTANIQUE RAISONNÉE, ou *Exposition des Faits principaux et des Lois concernant la Distribution Géographique des Plantes de l'époque actuelle*; par M. ALPH. DE CANDOLLE. 2 vols. 8vo. Paris.

(Continued from p. 121.)

The theory of the origin of races is well discussed, though somewhat too lengthily, and is illustrated by the supposed case of a species, consisting of eight varieties, inhabiting a large island, the var. α and var. θ of which species are extremely dissimilar. Geological changes may break the island up into an archipelago of eight islets, of which each may retain but one or a few of the varieties; further geological conditions may destroy all the islands but those containing vars. α and θ , and the elapsed time may have sufficed to render these permanent races, which hence have become undistinguishable from species. Nor does the difficulty end here: the two vars. α and θ , which would perhaps in our day be ranked only as doubtful species, will, if they continue segregated, become more and more confirmed in their differences, and consequently be better entitled to rank as species. The above idea is not new, and may be greatly extended; thus we may imagine that

other geological conditions may, by extending one islet in one direction and the other in an opposite one, whilst their contiguous shores are depressed, remove the two islets and their induced races to indefinitely great distances; and that these changes may be accompanied with others of climate that may alter the appearance of the species beyond all probability of their common specific origin ever being even so far assumed as to suggest experiments to prove them one.

The admission of such facts (and who can deny them being both philosophical in the abstract, and capable of absolute proof, to some degree at least, under existing conditions?) does appear to render the attempt to arrive at any definite conclusion as to the limits of many species a desperate one. All this M. de Candolle feels and candidly admits, and from the very horns of the dilemma he proposes that a position may be taken up, upon the ground that permanence of form amongst wild plants has been proved during the short period of our experience, and upon the grand point that many existing species have not changed since the days of the ancient Egyptians, or since the more ancient period of the deposits of turf, etc.*

That this fact however leads to no practical result, M. de Candolle admits, because it is impossible to ascertain the state of species during many thousands of years; because of the uncertainty of the period to which we are carried back, and because induced forms (*formes dérivées*—races) are probably less numerous than original specific forms. The last point is regarded as very important, and the facts adduced by M. de Candolle as illustrating it are extremely valuable.

In the first place, he says that races produced by cultivation never so far depart from their original form as to be mistaken for different genera.† Thus *Brassica oleracea*, *campestris*, and *Napus* have pro-

* All naturalists however will not go even so far as this; they will deny that the Egyptian monuments and relics, and the fragmentary remains of plants in peat bogs, etc. afford even tolerable evidence of specific identity. Let any unprejudiced naturalist examine the minute often solitary characters upon which so many species of existing plants are founded, and then ask himself how it is possible to pronounce two plants to be specifically identical without at least having flowers and fruit and leaves of both? Can any one doubt this, who will only take up two or three of the best European Floras, and see what differences of opinion there are as to what are species and what not, amongst our commonest and biggest forest-trees,—oaks, elms, pines, birches, etc.? Even habit of growth is sometimes insisted on as in itself proof of specific difference!

† This is assuming genera to be natural and not conventional groups of species. There are no doubt cultivated forms of plants that afford, abstractedly, good generic characters.

duced a multiplicity of hereditary races, but the characters of their flowers and fruit are still those of *Brassica*. So with the races of *Triticum*, these may differ in the number of seeds and their form, and in their awns (beards), but no one has proposed to make a new genus of any of them.*

The fact that isolation is one of the conditions that leads most usually to the subdivision of species or formation of subspecies, if taken together with another fact, that the majority of analogous species are aggregated within more or less contracted areas, appears to M. de Candolle to militate against the hypothesis that time and isolation may account for the origin of species. Thus the hundreds of Cape Heaths, he says, cannot have owed their origin to geographical isolation, for we cannot conceive causes that would, after their segregation, have aggregated them again. The genera *Stylidium*, *Solanum*, *Aster*, *Astragalus*, *Cistus*, and *Linaria*† are quoted as affording parallel cases.

Upon the whole M. de Candolle inclines to admit two modes of originating new specific forms: the one derivative, which is very rare and confined to species that are very closely allied‡ but geographically sundered; the other an original creation, "mode par une formation propre," which certainly obtains for the immense majority of species.

* Here again there is room for much question. If the legitimate consequences of this are pursued, the genera of Grasses must be reduced to very few, and a number of small genera around *Triticum* itself must be eliminated. We do not admit bearded and beardless Wheats to be different genera, because we know their history too well, and not because they do not in the abstract present good generic characters; for there are many genera of Grasses contradistinguished by all botanists by those very characters, and which present species that vary so that they may be referred indiscriminately to any of them.

† The very same class of facts is adduced, by some advocates, of the development of many species out of one, in support of their view; and, in conjunction with the fact that all these genera, except perhaps *Stylidium*, present heaps of scarcely distinguishable species as subspecies or races, are no doubt apparently strongly in support of it; to which may be added, in the case of *Cistus* and *Erica*, the facility of hybridization and impossibility of tracing the parents of many of our garden hybrids. If instead of citing those foreign genera we take some more familiar ones, also presenting groups of geographically aggregated species, as *Rosa*, *Rubus*, *Salix*, about the limits of whose species no botanists are agreed, the case will appear as strongly in favour of aggregation as of isolation in being an agent in producing species or subspecies. Even time does not seem to be necessary in some cases, for speciemongers find new species of Willows in modern osier-beds and new Brambles by roadsides.

‡ It will be argued by many that if the derivative origin is granted to any species, it may, with no violence to nature, be extended to all; both time and isolation being necessary, it is obvious that these elements may in some degree be complementary to one another. Isolation is in its operation synonymous with altered surround-

These considerations lead M. de Candolle to a still more purely hypothetical subject, viz. the greater variability of species in certain geological epochs or during certain epochs of the existence of the species.

Against the idea that species are more variable at certain times than at others, M. de Candolle urges that it is to revolutions of the earth's surface that we must look for causes that would effect sudden changes of species, and that these revolutions can only be exaggerations of operations now in action, and which do not produce the slightest effect on the majority of existing species.

M. Lecoq's theory, that species like individuals have a definite period of development, followed by a stationary one, and that again by extinction, is opposed by M. de Candolle, firstly, on the ground that it is unphilosophical to confound a complex with a simple phenomenon. According to Isidore G. St. Hilaire and many other naturalists, the so-called species of any epoch are all races derived from the fewer pre-existing races; and M. de Candolle considers the fact as proven, that a race once established is itself very variable, citing the opinion of M. Louis Vilmorin, who has shown satisfactorily that to produce a race the constitution of the species operated upon must be shaken (*ébranlée, affolée*), after which it becomes more amenable to the experimenter. Now, according to Lecoq, newly created forms are more variable than the same are at a later period, and those genera that contain a great many indeterminable forms (*Rosa, Salix, Viola, Polygonum, Thalictrum, Rubus*, etc.) may hence be assumed to be in a young or partially developed state.* These ideas are combated by M. de Candolle, who shows that they are founded mainly on a preconceived idea of what is to be considered a species and what not; that, for example, the botanist who sees only five or six distinct species of *Rubus*, each of which varies infinitely, looks upon the case in a totally different light

ing conditions; and as greatly altered conditions are often seen suddenly to induce changes in species, so may slightly altered conditions produce equal changes, if time enough be allowed for their operation. Grant the first step, say the opponents of M. de Candolle's hypothesis, and allow the formation of the race or subspecies, and a repetition of the conditions may well so increase the amount of change as to produce a species, a genus, and so forth.

* Carrying out this view will infallibly lead to the conclusion that the majority of plants are new creations; for there is not a single large genus that is not involved, and the exotic ones to an extent which few botanists have an adequate idea of. It is easy to draw lines of distinction between single herbarium specimens of these; but as our collections increase the previously well-defined species of large genera become more and more difficult of discrimination by the intercalation of osculant varieties, races, and species.

from another who considers that twice ten times that number of species should be maintained. M. de Candolle also shows that the degree of variability of the genera is to a great extent in direct proportion to the antiquity M. Lecoq assigns to them, and in which relative scale of antiquity M. de Candolle agrees, namely, that the oldest are Cryptogams, next Monocotyledons, and lastly Dicotyledons.

The purely hypothetical question of the origin of existing species is remarkably well treated, and is also illustrated as fully as it is capable of being, which however is not saying much. The first (or the several first) organic beings were either elaborated from inorganic matter in accordance with some physical law unknown to us, or they were created out of nothing, or out of inorganic matter, by a higher power not residing in matter ("par une cause supérieure étrangère à la nature"). Each of these hypotheses, he adds, demands a something which we can neither see, feel, nor even comprehend.

Some naturalists have sought to escape the difficulty, says M. de Candolle, by the doctrine of progressive development, an hypothesis which does not do away with the necessity of a supernatural cause to account for the origin of species; to which he adds, that this is a subject upon which we know nothing. It marks the boundary between a science of observation and one of speculation; it however branches off into three others which are more capable of study.

1. On the primitive centres of vegetation he arrives at three conclusions:—that the region in which a species originated cannot be exactly determined; that species have originated at numerous different regions; that some of these regions may be indicated with a certain degree of probability, but not with precision, on account of the interchange of species and the probable disappearance of some of the regions.

2. The creation of species has probably been successive. This all existing facts in both geology and botany tend to show.

3. With regard to the hypotheses that species are created as single individuals or in single pairs, or that many individuals of each were created at once, the former appears to M. de Candolle to be too seductive from its simplicity, and adds that it has led many authors into a palpable contradiction. He says that almost all the advocates* of a single

* M. de Candolle is here in error; amongst British naturalists at any rate this opinion does not prevail. After all, it may demand no greater stretch of imagination to fancy the creation of a full-grown tree, with its misletoe attached, than one without it; or of a tree rather than of its seed.

origin for each species have admitted a simultaneous creation, if not of the whole world, at least of all vegetables, and of all animals but man, and in doing so they have lost sight of the fact that some plants are parasitic on others, and some require the shade of others.

The strongest objection however to the creation of single individuals* is, in M. de Candolle's opinion, the disconnected species alluded to at p. 116, whose individuals he supposes to have originated at the spots where they are now found, or at any rate at localities nearer to those spots than they are to one another.

Under the head of Duration of Species and of Races, the subject of their disappearance is discussed; the absolute extinction of them M. de Candolle appears to think is sometimes too hastily assumed, because relays of seeds lie buried in the soil, etc.†

Chapter 12. On the Geographical Habitats of Genera: the Limits and Form of their Habitats.

In the preliminary discussion of M. de Candolle maintains the view which he has always held (in opposition to the majority of botanists) that genera are even more naturally limited groups than species.‡ The

* The admission of many centres of creation for each species opens the door to the admission of many other hypotheses, all tending to disprove the permanent distinction of species; for instance, if species are created at two different spots, they will, it is only reasonable to suppose, appear in many cases as two races; and if in many spots, we may have as many races originally created, whence race and species become practically convertible terms from the very beginning of the creation of the species. Again, if species are successively created, why may not individuals of the species be also? and if this be granted, the subject of distribution is hopelessly complicated. To the progress of modern geology such admissions are fatal.

† The possibility of species being thus preserved when to all appearance lost is no doubt true; but in reality it is not worth alluding to as a conservative agent of any appreciable effect. M. de Candolle alludes to it especially in reference to the asserted extinction of St. Helena species. The forests of this islet (extending over several thousand acres) were, it is well known, destroyed, and with them a native vegetation that may fairly be assumed to have numbered several hundred species. Of this native vegetation now very few species remain, and these are either confined to places where the forest was not destroyed, or are plants that grew where it never existed. If the seeds of the others had remained alive in the soil, there would surely have been some renovation of the vegetation from the old; but there has been none. Since the island was first botanized, half a century ago, no new plant has appeared on it, and every old one, without exception, is getting rarer; some of them indeed have become totally extinct. Hundreds of acres of St. Helena soil are disturbed for gardens, plantations, and agricultural operations, and numberless opportunities are thus given for any buried seeds to grow and flourish, but nothing of the kind has ever taken place. The wild plants of the remaining woods, and the trees forming those woods, do not even spread into the artificial shrubberies and plantations on whose outskirts they are abundant.

‡ In this opinion we do not agree; neither do we admit the premises from which M. de Candolle draws his conclusions, as that an intelligent observer who is no

subject itself, of the geographic limits of genera, can hardly be said to be discussed in the Chapter; but our author appears to intimate that their areas are more restricted than we should have supposed them to be.

(*To be continued.*)

The FLOWERING PLANTS and FERNS of GREAT BRITAIN: an Attempt to Classify them according to their Geognostic Relations; by JOHN GILBERT BAKER.

This, which is a paper read at Glasgow, before the twenty-fifth meeting of the British Association with additions, is an attempt, first, to arrange the British flowering plants and Ferns according to their predilection for certain soils; and secondly, to determine the amount of change that may be effected in species by the soil in which they grow. The Author states that his sketch is based upon the model of the plan pursued in Thurmann's 'Essai de Phytostatique appliqué à la Chaîne du Jura,' and adds, that his principal inducement is the desire to suggest inquiry relative to the subject amongst more experienced botanists and geologists than himself.

The attempt is a very meritorious one, and deserves more at the hands of British botanists than is implied by the comments made by those who heard it read at the time, and which Mr. Baker has very candidly appended to his Essay. The Author starts with considering the soils as being primarily divisible into two classes,—those that disintegrate easily, and yield an abundant superficial, usually damp detritus, and those which disintegrate with difficulty, and yield a scanty, dry detritus. Every species is considered (and no doubt truly) as being more or less adapted to flourish upon various kinds of soil, just as it is more or less adapted to inhabit various climates. Further, under equal climatic conditions, different species will always more or less confine themselves to one or the other class of soil; but with change of climate, under equal conditions of soil, certain species disappear, and the remainder are, upon the whole, less restricted to one kind of soil. Thus, passing from a dry climate to a moist one, under equal conditions of soil, it is obvious not only that the dry-climate plants will dis-

botanist recognizes genera before he does species; it might indeed be argued, with as much show of reason, that if genera are not more natural than species, the latter are not natural at all! so arbitrary are their limits throughout whole large Natural Orders.

appear, but that those which in the dry climate only grew on the wet soil will, in the wet climate, grow also on the dry soil.

From these considerations Mr. Baker proceeds to sketch out the surface of Great Britain as characterized by its geological structure, and (as is assumed) its consequent superficial soil, of which he recognizes six principal modifications; for these we must refer to his Essay, with the casual remark that we find no allusion to the phenomena of the "drift," which, we believe, in many places spreads the detritus of rocks easily disintegrated over immense surfaces, coloured in our geological maps as having a very opposite subjacent rock, and which, if we are right in our supposition, must introduce a disturbing element into Mr. Baker's calculations.

A co-ordination of these data with Watson's botanical provinces and zones follows, from which the Author proceeds to classify his facts, arranging the British plants under thirteen heads, of which the most important to notice are those including—1, the species common to all soils (700 sp.); 2, those having a marked preference for soils disintegrated with difficulty (92 sp.); and 3, those with a marked preference for soils not easily disintegrated (144 sp.). The other divisions include plants that, for special reasons, are not included under any of the above: there are modifications of these heads; as, Maritime, Hibernian and Sarnian, local or dubious, agricultural aliens and introductions, horticultural aliens and introductions.

To many of the species thus ranked we might take exception, as with regard to the *Hellebori*, *Clematis*, *Atropa*, *Sesleria*, having a marked preference to soils with difficulty disintegrated, seeing that some of these flourish in the deep beds of stiff clayey "drift" in Suffolk and elsewhere, and the *Sesleria* on schist rocks in some parts of Scotland; as also to the introduction of such water-plants as *Isnardia*, *Elatine*, and other absolute aquatics, into the list of species supposed to have a marked preference for soils easily disintegrated; and though in favour of generalizing upon strong indications of preference for certain soils or climates, in subjects like this, where absolute data are almost inaccessible, yet we cannot help remarking that of 1615 species only 92 are quoted as very strongly indicative of one kind of soil, and 144 of the other, numbers which might be considerably reduced without violence to facts.

Lastly, the Author opens the most important and curious question, the modification of specific type through the influence of the soil, and

adduces *Viola hirta* and *odorata* as a case in point. Those who have studied the genus *Viola* as a whole, will not be surprised at Mr. Baker's conjecture that the two cited may be varieties of one, and every one will appreciate the value of his observations on the gradual change of habit in each produced by the soil it grows upon. This is a subject which we are glad to perceive Mr. Baker is pursuing further, and we cannot conceive a more interesting or suggestive one, or one upon which the time and acumen of a good local observer can be better expended.

With regard to the main question, the preference of species for soils, we doubt if it admits of much greater illustration at the hands of British botanists than Mr. Baker has given; it requires that the whole trans-Britannic range of each species be known before any single datum can be considered absolute. The chemical nature of the soil has also probably some effect (though very slight indeed), as Planchon's observations, published in the 'Bulletin de la Société Botanique de France,'* would seem to indicate.

We cannot dismiss Mr. Baker's little Essay without hearty commendation for the energy with which he has pursued a very difficult inquiry, and would add a hint that the subject is somewhat obscured by the use of compound words that are not euphonious. Such terms as Calcareo-eugeogenous and Psammo-dysgeogenous (invented, we believe, by Thurmann) have the merit of being explicit, but it is always a question whether, when a subject is complicated, it is not better to avoid introducing into it any new terms that are not both short and significant.

E. M. C. : *Popular GEOGRAPHY of PLANTS, or a Botanical Excursion round the World.* Edited by CHAS. DAUBENY, M.D., F.R.S., etc., Professor of Botany and Rural Economy in the University of Oxford. Royal 16mo, with coloured plates. London, 1855.

The present volume forms one of Mr. Lovell Reeve's series of Popular Natural History, which cannot fail to lead the reader on to the less popular, but more philosophical, writers upon this interesting subject. The excellent Dr. Daubeney has kindly taken an interest in the publication, and has prefaced it by a well-written essay of twenty-five pages,

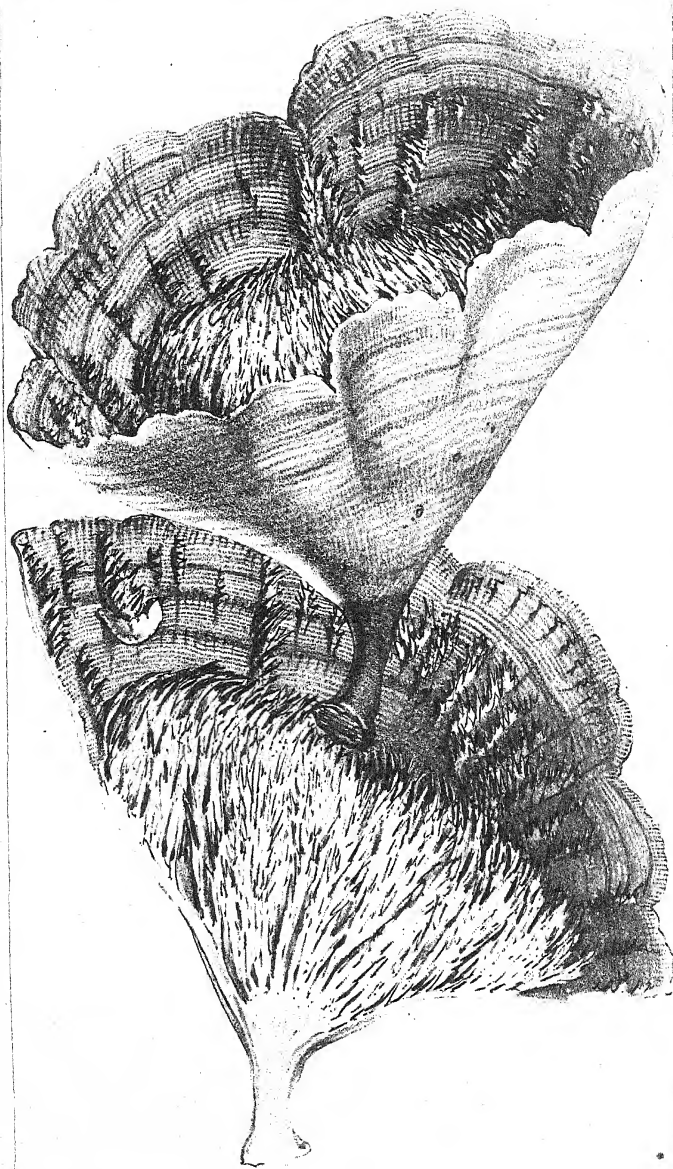
* Sur la Végétation spéciale des Dolomies dans les Départements du Gard et de l'Hérault, par J. E. Planchon.

and concludes it by remarking that, "without meaning to make himself responsible for the accuracy of all the details introduced into its pages, I am ready to bear my humble testimony to the general truthfulness of the descriptions given, and may therefore venture to recommend the book as one likely to supply a void in the popular scientific literature of the day; inasmuch as the subject is therein treated, on the one hand, in a less perfunctory manner than is commonly done in works embracing the entire extent of Physical Geography, and, on the other, on a less dry and technical plan than appears to have been hitherto the rule in the larger treatises on the Geography of Plants which have come before the public."

The general plan or arrangement of the work is that of Meyen's 'Botanical Geography,' and that has supplied the framework of the greater part, the botanical details being generally derived from other sources, and these sources are fully acknowledged in their appropriate places or in the Author's Preface. The useful diagrams and maps are adapted from the best authorities, as are the characteristic features of vegetation in the plates; but these plates, being executed by the same artist as those in Dr. Seemann's book* lately noticed, are certainly no improvement on the originals. The *Umbelliferae* (Tab. IV.), the *Screw-Pine* (Tab. IX.), the *Tara Plant* (Tab. X.), and *Bread-fruit* (Tab. XII.), have not the shadow of a resemblance to the plants themselves. Here however the plates are placed opposite their respective descriptions.

The work is divided into twelve heads or chapters, and the vegetation of a certain zone is briefly treated of under each:—1. The *Polar Zone*, including all the lands above 72° of lat. 2. The *Arctic* (and *Antarctic*) *Zone*, between the Arctic (and Antarctic) Circle and 72° . 3. The *Subarctic*, from 58° to the last-mentioned zone. 4. The *Colder Temperate Zone*, from 45° to 58° of latitude. 5. The *Warmer Temperate Zone*, from 34° to 45° of latitude. 6. The *Subtropical Zone*, from the Tropics to 34° of latitude. 7. The *Tropical Zone*, from 15° of lat. to the Tropics. 8. The *Equatorial Zone*, including 15° of lat. on each side the equator. The 9th and last chapter is devoted to "the distribution of British Plants, and their relations with the different Floras of the Continent," on which subject the writings of Professor Forbes have been the Author's chief guide.

* Popular History of Palms.



Definitions of Rare or hitherto Undescribed AUSTRALIAN PLANTS, chiefly collected within the boundaries of the Colony of Victoria; by Dr. FERDINAND MUELLER, Government Botanist for the Colony of Victoria.

(Continued from p. 150.)

Antennaria, Gartner. (Sect. Actina.)

Scales of the involucre radiating. Heads of the fertile plants with several rows of female flowers in circumference, and with hermaphrodite ones in the centre. Heads of the sterile plants with only hermaphrodite flowers, a few rarely fertile. Pappus at the extremity clavellate, with the exception of that of the female flowers, which is not thickened.

113. *Antennaria uniceps*, F. Muell.; depressed, rooting, densely foliate; leaves subcoriaceous, somewhat rigid, channelled-linear, acute mucronulate, glabrous; petioles clasping, scarious, woolly fringed; flower-heads solitary, almost sessile; scales of the involucre glabrous, somewhat red, at the base green, the outer ones ovate, inner ones narrow-lanceolate, not radiating; pappus of the sterile flower-heads scabrous, very slightly thickened at the apex.

HAB. On gravelly places near springs, or such as are subject to inundations in the Munyang Mountains (5-6000 feet).

A small tufted herb, of some resemblance with *Raoulia tenuicaulis*. The fertile flowers are yet unknown.

114. *Antennaria nubigena*,* F. Muell.; stems herbaceous, creeping, corymbose, short, upright, caespitose; leaves dense, flat, oblong or ovate-cuneate, somewhat acute, entire, spreading, clasping at the base, one-nerved, on both sides covered with a thin, appressed, silver-grey toment; flower-heads terminal, generally solitary, sessile; involucre hemispherico-campanulate; its scales smooth, acute, entire, the middle ones lanceolate-oblong, white at the top; achenia tereti-oblong, scabrous.

HAB. On the rocky summits of the Cobboras Mountains, covered nearly throughout the year with snow.

A truly alpine species, like most others of this interesting genus, formerly not found represented in Australia, unless erroneously referred by Candolle to *Gnaphalium* (as *G. catipes*).

* *Raoulia Tasmanica*, H.f., and *Gnaphalium catipes*, DC.—Ed.

115. *Senecio vagus*, F. Muell.; glabrous; stem suffruticose, with spreading branches; inferior leaves large, pinnatisected, with generally two pairs of segments, which are long-lanceolate, acute, remotely and grossly toothed; the terminal segment very large, trifid and toothed or lacinated; upper leaves lanceolate, entire or trifid, tapering into a short petiole; flower-heads paniced, with a conspicuous peduncle, and large lanceolate-linear bracteas; scales of the almost bell-shaped involucre ten to twelve, equal in length to the disc, acute, on the margin scarious, on the back with black papills; ray spreading; achenia glabrous, angulate, furrowed, transversely rough, half as long as the pappus.

HAB. In shady moist valleys of the Dandenong Ranges, of Mount Disappointment, and on the Delatite.

A smaller variety (*alpestris*), with thicker, more dissected leaves, occurs on the rocky summit of Mount Buller.

XXIX. STYLIDEE.

116. *Coleostylis Sonderi*, F. Muell.; all over glandulously pilose; stem simple or branched at the top, foliate; leaves alternate, roundish heart-shaped or rhomboid, the uppermost sessile, the rest petiolate; pedicels axillary, solitary, forming a terminal corymb; basis of the corolla tubulose.

HAB. On wet places near the Violet Creek, found by Mr. C. Wilhelmi.

A neat little plant of the habit of *C. Preissii*.

117. *Stylidium* (Sect. *Tolypangium*) *soboliferum*, F. Muell.; soboles numerous, thread-like; leaves all radical, crowded together in a dense globule, nearly terete, glabrous, bearing a terminal hair; interstinct scales wanting; racemes few-flowered, corymbose or paniced, together with the scape glandulously pilose; calyx five-parted; lip with appendages; faux of the corolla naked.

HAB. In sandy, stony declivities of the Grampians, the Serra, and the Victoria Ranges.

An elegant little plant, quite of the habit of a *Saxifraga*. It is nearest related to *S. piliferum*, and in some degree also to *S. saxifragoides* and *S. assimile*.

XXX. GOODENIACEÆ.

118. *Velleya connata*,* F. Muell.; high, glaucous, smooth; stem

* This is probably the *Velleya pandureiformis* of Allan Cunningham.—ED.

upright, dichotomous, with bearded axils; leaves all radical, elongate-lanceolate, one-nerved, entire, contracted in a petiole of equal length; bracts very large, almost deltoid, acute, half conerete, entire; segments of the calyx lanceolate and ovate, acuminate; style villose; seeds densely punctate, surrounded by a broad wing.

HAB. On scrubby sand-hills towards the junction of the Murray and Murrumbidgee.

This highly curious plant also possesses the tonic bitterness which I discovered in numerous species of *Goodeniaceæ*.

XXXI. EPACRIDÆ.

119. *Leucopogon* (Sect. *Brachystachys*) *Macraei*, F. Muell.; tall, much branched; branchlets very little spreading, firm, velvety; leaves spreading, ovate or from a round base lanceolate, stalked, flat, not mucronate, glabrous, above shining, in front ciliolate; spikes terminal or below the apex, few-flowered, soon erect; calyx and bracteoles blunt, ciliolated; tube of the corolla hardly longer than the calyx; anthers half-exserted; style glabrous, enclosed; drupe globose, red, generally four-celled, nearly dry.

HAB. In valleys on the sources of the Mitta Mitta, near Mount Hotham and Mount La Trobe, as also along the torrents of the Coborobor Mountains (5–6000 feet).

This fine species is dedicated to Andrew M'Crae, Esq., as an acknowledgment for much support received from him in my travels.

120. *Decaspora Clarkei*, F. Muell.; stems short, diffused; branchlets slightly downy; leaves thinly coriaceous, flat, oblong-lanceolate, acutish, three- or five-nerved, without a mucro, very much longer than the petiole, in front scabrous; spikes few-flowered, corymbose, as long as or longer than the leaves; faux of the large corolla bearded.

HAB. In shady ravines at Mount Wellington, half-buried in decaying leaves; very rare.

This elegant little shrub bears the name of Captain Andrew Clarke, the worthy President of the Philosophical Society, to whom the author is under manifold great obligations for promoting his researches.

The four other species are endemic Tasmanian ones. The large bluish berries of this are eatable.

XXXII. OLEACEÆ.

121. *Notelæa venosa*, F. Muell.; arborescent; branchlets nearly te-

rete, glabrous; leaves large, opaque, ovate or elongate-lanceolate, acuminate, gradually narrowed into the petiole, on both sides perfectly smooth and net-veined, not or indistinctly dotted, with entire or imperfectly repand margin; racemes axillary or lateral, when flowering at least three times shorter than the leaves; teeth of the calyx unequal; stigma subsessile, bifid; drupes large ovate.

HAB. In woods of the eastern part of Gipps' Land.

It shows affinity as well to *N. laurifolia* from New Zealand, as to *N. reticulata* from eastern sub-tropical Australia.

XXXIII. LOGANIACEÆ.

122. *Mitrasacme* (Sect. *Lysigyne*) *distylis*, F. Muell.; annual, minute, glabrous; stem upright, simple or a little branched, smooth; leaves oblong-linear, somewhat carnulent; pedicels axillary and terminal, setaceous, solitary, rarely two or three together, at least twice as long as the leaves; calyx bell-shaped, very short, bilobed, not excelled in length by the corolla; styles separated; capsule enclosed; seeds net-veined.

HAB. Around swamps near Mount William.

In stature resembling *Mitrasacme paradoxa*, but from this as well as all the other species widely different in its disjoint styles.

XXXIV. GENTIANEÆ.

123. *Sebæa* (§ *Phyllocalyx*) *albidiflora*, F. Muell.; leaves somewhat fleshy, broad-ovate, the lower ones roundish, blunt, almost nerveless; sepals indistinctly keeled, oblong, blunt, winged at the base; cyme simple, close; lobes of the corolla four, whitish, ovate-oblong, blunt, half as long as the tube; style short-exserted, with a bifid stigma.

HAB. In saline pastures from Port Phillip to Port Fairy, and at George Town in Tasmania.

Approaches next in its characters to *S. albens*, from South Africa.

124. *Limnanthemum crenatum*, F. Muell.; leaves cordate-orbiculate, crenate, obsoletely palmatinerved, above even, beneath densely glandulose; segments of the calyx narrow-lanceolate, less than half as long as the corolla, exceeding but little the length of the capsule; segments of the yellow corolla on the margin and orifice fimbriate, inside longitudinally broad-cristate; style thick, abbreviate; stigma with five lacerate wings; hypogynous glands fimbriate; capsule polyspermous; seeds ovate, lævigata, hardly keeled.

HAB. In tranquil bends of the Murray River, Murrumbidgee, and Mitta Mitta, and in the nearest lakes and lagoons.

A most handsome, and, with regard to its crenate leaves and the structure of the stigma, equally singular species.

XXXV. SOLANACEÆ.

125. *Solanum vescum*, F. Muell.; fruticose, unarmed, erect, smooth; twigs winged; leaves large, sessile, long-lanceolate, undivided or furnished towards the middle, on both sides, with one or two lanceolate segments; calyx of the corymbose flowers to the middle five-cleft, with thick, subdeltoid, cuspidate, unkeeled lobes; corolla smooth, somewhat folded, violaceous, almost bell-shaped, with five very short lobes; filaments thread-like, equal in length to the yellow, oblong anthers; berries large, green, nearly globose.

HAB. The Gunyang has been found, as far as I know, only yet in Gipps' Land, where it occurs on sand-ridges around Lake Wellington, on the coast towards the mouth of the Snowy River, on grassy hills at the Tambo, the Nicholson's River, and Clifton's Morass, on the rich shady banks of the Latrobe River, and near the Buchan River.

A shrub, with spreading branches, sometimes more than six feet high, but already in the first year producing flowers and fruits, by which means the plant appears then to be herbaceous. Branches woody, covered with a brownish-grey, wrinkled, and fissured bark. Leaves decurring along the twigs, hardly shining, beneath a little paler, generally somewhat scabrous; middle rib of the leaves and their segments above sharply prominent, beneath yet more protruding, and these semi-terete; the lateral nerves numerous, patent, and conjoined by veins. Corymbs axillary, few-flowered, either solitary or twin, sometimes cymose, sometimes racemose. Peduncles terete, often slightly angulate, from 1-2 inches long, rarely wanting. Pedicels as long as the peduncles, terete, solitary, gradually passing into the calyx. Calyx nearly campanulate, in age carinulate; the teeth at length 2-3 lines long. Corolla tender, lilac-blue, nearly all times of an equal colour, but rarely outside with exception of the wing-like part greenish, undulate at the margin; the lobes either rounded or emarginate. Stamens considerably shorter than the corolla; filaments very thin; anthers $1\frac{1}{2}$ line long, opening at the apex, but also bursting more or less longitudinally. Style white, longer than the stamens. Stigma capitellate, bilobed.

Berries when perfectly ripe pulpy, sometimes above 1 inch long. Seeds ovate-roundish, compressed, with a grey net-like tissue.

126. *Solanum lacunarum*, F. Muell.; armed all over with setaceous-subulate, straight prickles; stem dwarf, suffruticose, branched; leaves petiolate, in circumference oblong-ovate, sinuate-pinnatifid, above conspersed with stellate hair, at length calvescent, beneath as well as the branches covered with a thin grey toment; lobes of the leaves oblong, rounded-blunt, with entire margin; peduncles terminal, two- to six-flowered, aculeate; segments of the calyx acutish, deltoid-lanceolate; anthers yellow.

HAB. In lagoons, which are dry during the summer season, near the junction of the River Darling and Murray.

It differs from *Solanum cinereum* (R. Br. Prodr. i. 446), the only one to which it bears similarity, in its blunt, entire leaf-lobes, which are, together with flowers and berries, considerably smaller, by almost constantly armed peduncles and pedicels, and by hardly cuspidate segments of the calyx.

127. *Solanum pulchellum*, F. Muell.; unarmed; stems procumbent, suffruticose; leaves on somewhat long petioles, ovate or narrow-oblong, blunt, repand, entire, above pale green, laxly tomentellous, below clothed with a shineless, thin, grey toment; peduncles two- to five-flowered, generally surpassing the length of the petiole; calyx half as long as the corolla, carinate, with triangular, acuminate segments; anthers yellow, slightly attenuate, surpassed in length by the style.

HAB. Along the Wimmera, Avoca, and Murray Rivers; thence through the desert-country as far as Lake Torrens, Spencer's and St. Vincent Gulfs.

Allied to *Solanum dianthophorum* (Dunal Sol. 183), and to an undescribed species discovered in Central Australia by Captain Sturt, of which I subjoin the definition:—

128. *Solanum Sturtianum*, F. Muell.; stem upright, fruticose, scantily armed with short, acicular prickles; leaves on somewhat long petioles, lanceolate-oblong, blunt, entire, unarmed, above glabrescent, beneath clothed with a very thin toment; peduncles three- to five-flowered, generally surpassing the length of the petiole; calyx much shorter than the corolla, with triangular, acute teeth; anthers yellow, attenuate.

Another species, brought from the interior of this island-continent by the same intrepid traveller, might be characterized as follows:—

129. *Solanum oligacanthum*, F. Muell.; stem upright, fruticose; branches beset with distantly scattered setaceo-subulate prickles; leaves small, cordate, obtuse, entire, on both sides as well as the branches covered with a very thin grey toment, hardly armed, short-stalked; peduncles two- or many-flowered, short; calyx half as long as the corolla, with deltoid, acute segments; anthers yellow, excelled in length by the style.

This species approaches to *Solanum orbiculare* (Dunal, Syn. 27), from which it differs chiefly in its not shining toment, and its exact, heart-shaped, somewhat larger leaves.

To complete my additions to the elaborate description of more than nine hundred *Solanum* species, published by Professor Dunal in the thirteenth volume of Candolle's 'Prodromus,' I beg to add yet the diagnosis of an unknown South Australian species, having also given since an account of three others in Professor Schlechtendal's 'Linnæa' (vol. xxv. p. 432-434).

130. *Solanum simile*, F. Muell.; unarmed, smooth; stem upright, suffruticose; leaves narrow-lanceolate, elongate, entire or lobed at the base, thin-venose; corymbs lateral, few-flowered, simple or divided; segments of the half five-parted calyx rounded, apiculate; berries globose, nodding.

HAB. On less fertile plains on the Murray and Angas River, on Spencer's and St. Vincent Gulfs, and in Kangaroo Island.

It is distinct from *Solanum laciniatum* in its constantly low stem, smallness of all parts, its never pinnatifid leaves, its shorter, nodding pedicels, and smaller, always spherical berries.

I conclude these contributions towards the Australian *Solaneæ* with the remark, that this Order received, by the first and ever-memorable expedition of the unfortunate Dr. Leichhardt, the addition of the genus *Datura* (in *Datura Leichhardtii*), and by the researches of Dr. Behr, the additional genus *Lycium* (in *L. Australe*), both unnoticed not only in the golden 'Prodromus' of R. Brown, but also in Dunal's monograph, published in 1852.

XXXVI. BORAGINÆÆ.

131. *Heliotropium lacunarium*, F. Muell.; stems herbaceous, upright or procumbent, appressed-hairy; leaves somewhat long, petiolate, oblong or lanceolate-ovate, nearly blunt, entire, not rugose, on both sides

scabrous, beneath along the margin and nerve pilose; spikes ternate, geminate or solitary, ebracteate; segments of the calyx subequal to each other, of the length of the corolla-tube; caryopsides subovate, rugose, glabrous.

HAB. Around the lagoons, and in low localities on the Murray.

XXXVII. LABIATÆ.

132. *Prostanthera spinosa*, F. Muell.; branches numerous, spreading, hispid; twigs short, spinescent, foliate at the base; leaves lanceolate or roundish-ovate, acute, entire or repand, glabrous or below imperfectly hairy; peduncles thin, axillary, solitary, surpassing twice the length of the calyx, at the middle bibracteate; calyx sparingly hispid, its lips entire, the lower one hardly longer; corolla of lilac-colour, outward but little hairy; longer spur of the anthers exceeding nearly twice the cell, the other abbreviate.

HAB. On springs and irrigated rocks in the Grampians.

This species is remarkable for its prickly branchlets.

133. *Prostanthera coccinea*, F. Muell.; branches hirtellous; leaves small, somewhat thick, with reflexed apex, linear-oblong or simply linear, blunt, flat or on the margin slightly recurved, hairy-scabrous, at length glabrescent, in the axils fasciculate; flowers near the top of the twigs axillary; peduncles a little shorter than the calyx, which is, with exception of the ciliolate margin, glabrous, its lips entire, the lower one a little longer; corolla red, three times longer than the calyx, somewhat hairy, its upper lip longest; spurs of the anthers adnate, the longer one hardly as long as the cell.

HAB. In the Mallee Scrub on the Murray, on St. Vincent's and Spencer's Gulf.

A low, diffuse bush, allied to *P. microphylla* (A. Cunn., in Benth. Lab. p. 454).

134. *Prostanthera eurybioides*, F. Muell.; branches puberulous; leaves thick, very small, glabrous, linear-oblong, entire, slightly concave,—the younger ones fasciculate, those surrounding the flowers broad ovate; flowers axillary, solitary, on short peduncles; the lower lip of the glabrous calyx nearly retuse, little exceeding the rounded upper lip; longer spur of the anthers surpassing the length of the cell.

HAB. In the Mallee Scrub towards the mouth of the Murray River.

Resembles in habit *Eurybia lepidophylla*.

135. *Westringia senifolia*, F. Muell.; erect; stems densely hirsute; leaves about six in a whorl, crowded, spreading, lanceolate-linear, acute, sessile, with revolute margins, above glabrescent and scabrous, beneath as well as the calyces hirsute; flowers white, axillary, nearly sessile, forming on the top of the twigs a foliate spike; calyces to the middle divided, hardly as long as the leaves; its segments lanceolate-subulate.

HAB. On rocks in the Buffalo Ranges and on the summit of Mount Buller.

136. *Westringia violacea*, F. Muell.; leaves three in a whorl or rarely opposite, linear-lanceolate, awnless, with slightly recurved margins, glabrous on both surfaces or beneath along the rib hairy, above dotted-scabrous; pedicels, calyces, and twigs appressed-hairy; bracteoles linear-subulate, four or five times shorter than the calyx; teeth of the calyx lanceolate, acuminate, hardly longer than its tube; corolla violaceous, puberulous.

137. *Westringia Grevillina*, F. Muell.; leaves three in a whorl, coriaceous, broad-linear, spreading, acute, with revolute margin, above smooth, beneath as well as calyces and branchlets more or less grey velvet-hairy; teeth of the calyx much shorter than its tube; corolla velvet-hairy.

HAB. On the rocky coast of the Port Lincoln District, *C. Wilhelmi*.
Nearest in its affinity to *W. cinerea*.

(To be continued.)

DECADES OF FUNGI; by the REV. M. J. BERKELEY, M.A., F.L.S.

Decades LV.—LVI.

(With Plates V., VI., IX., X.)

Rio Negro Fungi.

(Continued from p. 143.)

541. *P. (Mesopus) pansus*, n. s.; pileo orbiculari latissime umbilicato tenui rigido radiatim rugoso lineatoque, brunneo, zonis crebris obscurioribus subtiliter pruinoso, margine arcuato; stipite tenui brunneo pruinoso; hymenio candido, poris punctiformibus, contextu pallido zonato. Spruce, n. 205.

HAB. On wood. Panuré.

Pileus $2\frac{1}{2}$ inches across, orbicular, sometimes attached behind, broadly umbilicate, marked with a few radiating ridges and numerous raised lines, brown, painted with many darker zones; margin arched. Stem 3 inches high, $\frac{1}{8}$ of an inch thick, straight, nearly even, brown, pruinose; hymenium white; pores punctiform.

A very beautiful and distinct species.

542. *P. (Mesopus) partitus*, n. s.; pileo tenui coriaceo infundibuliformi e basi sæpius sursum diviso zonato rufo-variegato lineato, margine lacerato-lobato; stipite elongato umbrino pruinoso; hymenio niveo; poris mediis acie prominente. Spruce, n. 20, 200. (Tab. X. fig. 1.)

HAB. On the ground in Caatingas, Panuré. February, 1853.

Pileus 2–3 inches across, thin, coriaceous, infundibuliform, split upwards from the base, and sometimes entirely divided, variegated with red-brown tints, zoned, rough with fine lines; margin lobed and jagged. Stem 4–6 inches high, $1\frac{1}{2}$ line thick, umber, opaque, finely pruinose. Hymenium snow-white when fresh, acquiring a slight ochraceous tinge in drying. Pores $\frac{1}{6}$ of an inch across, angular; dissepiments rather rigid; edge projecting; sometimes the edges of several pores are united and raised above the transverse partition so as to form linear compound sinuses; where they are most perfect they are hexagonal.

β. cuneatus. Spruce, n. 180.

HAB. On the ground in Caatingas, Panuré. March, 1853.

The pileus is 5 inches across, and split up from the very base so as to form a large wedge-like expansion. Though on a larger scale, I can see no distinction. (Tab. X. fig. 1. *P. partitus*, nat. size.)

543. *P. (Mesopus) renatus*, n. s.; pileo ex infundibuliformi laterali, lobato vel subintegro crenulato tenui rigido-papyraceo badio rufo-lineato rugoso glabro; stipite elongato umbrino pruinoso; hymenio albedo, poris angulatis parvis. Spruce, n. 169.

HAB. On the ground in Caatingas. February, 1853. Panuré.

Pileus 1–2 inches broad, infundibuliform, at length lateral, of a rich red-bay, slightly zoned and variegated, rough with little raised innate lines, sometimes so much so as to be rugose; thin, rigido-papyraceous. Stem 4–6 inches high, $\frac{1}{2}$ –1 line thick, pale umber, pruinose. Hymenium pale umber. Pores tender when young, gradually expanding into regular hexagonal cavities $\frac{1}{16}$ of an inch broad, sometimes produced on a part only of the hymenial surface, as if they were a secondary growth; edge regular, entire.

Allied to the last, but with much smaller pores. In one specimen there is not a trace of pores, insomuch that it looks like a *Stereum*.

* *P. (Mesopus) heteromorphus*, Lév. in Ann. d. Sc. Nat. Feb. 1846, p. 123. Spruce, n. 16, 33, 54.

HAB. On dead wood and on the ground in Caatingas. Panuré.

544. *P. (Mesopus) cassiacolor*, n. s.; pileo orbiculari tenui rigido coriaceo umbilicato opaco glabro cinnamomeo crebri-zonato-sulcato; stipite tenui irregulari; hymenio cinnamomeo; poris minutis angulatis; contextu subconcolori. Spruce, n. 189.

HAB. On the ground. Panuré.

Pileus 2 inches across, orbicular, thin, coriaceous, rather rigid, cinnamon-brown, not shining, umbilicate, marked with numerous concentric furrows and zones. Stem compound, cylindrical, 3 inches high, $\frac{1}{8}$ of an inch thick, rather irregular, brown, pruinose. Hymenium bright cinnamon; pores minute, $\frac{1}{140}$ of an inch across, angular.

Resembling in some respects *P. heteromorphus*, but distinguished at once by its bright hymenium.

545. *P. (Mesopus) procerus*, n. s.; pileo tenui coriaceo infundibuliformi rufo-badio zonato; stipite procero rigido umbrino fasciato; poris punctiformibus ocellatis, tramâ sulcatâ; contextu umbrino. Spruce, n. 165.

HAB. On the ground. Panuré. March, 1853.

Pileus 2 inches across, infundibuliform, thin, rigid, coriaceous, red-bay, with two or three zones. Stem 14 inches high, $\frac{1}{4}$ inch thick, somewhat compressed, umber, dilated above, pruinose, marked with browner bands. Hymenium dirty white, inclining to cinereous; pores punctiform; edge slightly sulcate.

There are but two specimens of this, in different stages of growth; the younger has a yellower tint. There are rudiments in the older specimen of three additional stems.

546. *P. (Mesopus) xylodes*, n. s.; pileo tenui coriaceo umbilicato umbrino zonis plurimis picto sublævi, margine arcuato; stipite gracili concolori pruinato; hymenio cinereo-umbrino; poris punctiformibus, tramâ leviter sulcatâ; contextu umbrino. Spruce, n. 42.

HAB. On the ground and amongst decaying leaves in Caatingas. Panuré.

Pileus $1\frac{1}{2}$ – $3\frac{1}{2}$ inches across, orbicular, thin, coriaceous, smooth, nearly even, umber-brown, painted with very numerous and often delicate

zones, so as to resemble the section of some dicotyledonous wood; margin arched. Stem 2–3 inches high, 1–2 lines thick, tolerably regular, of the same colour as the pileus, pruinose. Hymenium cinereous-umber; pores punctiform; edge tomentoso-granulated; trama slightly grooved.

A very beautiful species. The pileus is rather dull in appearance; but possibly when growing may have a shining sericeous aspect.

547. *P. (Mesopus) omphalodes*, n. s.; pileo orbiculari crassiusculo convexo umbilicato rugoso zonato hepatico; stipite gracili quandoque furcato; hymenio cinereo; poris punctiformibus, acie pruinosa; tramâ impressâ; contextu albo zonato. Spruce, n. 32, 194.

HAB. On the ground, more rarely on trunks, in Caatingas. Panuré.

Pileus 1–2 inches across, moderately thick, convex, umbilicate, liver-coloured, sometimes with a yellowish tinge, rugose and lineate; edge entire or crenate. Stem 4–6 inches high, 1–2 lines thick, sometimes forked, pale brown, pruinose, rooting. Hymenium concave, cinereous; pores punctiform, their edge pruinose, with the trama slightly grooved, terminating abruptly. The stem sometimes sinks deeply into the hymenium.

Those individuals with a yellowish tint have a smoother pileus and are more frequently zoned; the hymenium too is not cinereous; still I believe them to be the same species, because there is a specimen precisely intermediate, with the colours of the former and the sculpture of the latter, and both are intermixed. The variety may be called *P. omphalodes*, var. *fulvaster*.

548. *P. (Mesopus) ocellatus*, n. s.; pileo orbiculari convexo hepatico zonato sublævi radiatoque rugoso, opaco l. sericeo, nitido; stipite gracili; hymenio convexo cinereo; poris ocellatis; tramâ leviter sulcatâ; contextu sericeo cinnamomeo. Spruce, n. 192. (Tab. X. fig. 3.)

HAB. On the ground in Caatingas. February, 1853. Panuré.

Pileus $1\frac{1}{2}$ –3 inches across, convex, umbilicate, liver-brown, sometimes shining, sometimes opaque, even or radiato-rugose, zoned, convex, thin, coriaceous. Stem 4–7 inches high, $\frac{1}{4}$ –1 line thick, sometimes compound above, umber, pruinose. Hymenium cinereous; pores punctiform, with a white edge; trama slightly grooved. Substance of pileus silky, bright cinnamon-red.

This could scarcely be distinguished from *P. omphalodes* without attending to the texture, which is totally different. (Tab. X. fig. 3. *P. ocellatus*, nat. size.)

549. *P. (Mesopus) exilis*, n. s.; pileo orbiculari tenui umbilicato rufo-badio zonato rugosiusculo; stipite gracili umbrino pruinoso; hymenio cinereo; poris punctiformibus, tramâ leviter sulcatâ; contextu pallido. Spruce, n. 31.

HAB. On the ground. Panuré.

Pileus 1 inch across, orbicular, thin, coriaceous, umbilicate, liver-coloured, zoned, slightly wrinkled, substance pallid. Stem four inches or more high, scarcely a line thick, umber, pruinose. Hymenium cinereous; pores punctiform, with the trama slightly sulcate.

Differs from *P. ocellatus* in the pale colour of its substance, smaller size, etc.: it is closely allied, but on a more delicate scale.

550. *P. (Mesopus) Parmula*, n. s.; pileo tenui papyraceo orbiculari umbilicato lobato l. crenato nitidiusculo rufo-badio zonato; stipite gracili umbrino pruinoso; hymenio ex albido brunneolo; poris minutis subangulatis; contextu pallide umbrino. Spruce, n. 34.

HAB. On the ground in Caatingas. Panuré.

Pileus 1-2 inches across, thin, papyraceous, umbilicate or sometimes infundibuliform, red-bay, painted with many zones, tolerably even; margin lobed or crenate. Stem 3-7 inches high, $\frac{1}{2}$ -2 lines thick, umber, pruinose, sometimes fasciculate, even or nodulose, often rooting deeply. Hymenium at first nearly white, then tinged with brown; pores minute, $\frac{1}{12}$ of an inch across, slightly angular, not sulcate; substance pale umber.

551. *P. (Mesopus) marasmioides*, n. s.; pusillus; pileo orbiculari infundibuliformi badio zonato, margine crenato; stipite gracillimo; hymenio e pallido cinerascete; poris minutis subangulatis. Spruce, n. 21, 77.

HAB. On the ground in Caatingas. Panuré. A very common species.

Pileus $\frac{1}{3}$ - $\frac{3}{4}$ of an inch across, thin papyraceous, infundibuliform, bay, zoned, smooth; margin crenate. Stem $1\frac{1}{2}$ - $3\frac{1}{2}$ inches high, $\frac{1}{3}$ -1 line thick, umber, pruinose, often forked, rooting. Hymenium at first pale then cinereous; pores minute, $\frac{1}{12}$ of an inch across.

This is closely allied to *P. Parmula*, but it does not appear to be merely a dwarf state of that species. The pileus is essentially infundibuliform, the pores are smaller, and their tint different. It is a very elegant production.

No. 6 is a distinct species, which I have named in my herbarium *P. setipes*, but I have not sufficient materials to establish its characters.

552. *P. (Mesopus) hypoplastus*, n. s.; pileo orbiculari rigido ligneo profunde umbilicato opaco brunneo zonis obscurioribus crebris picto lævi, margine repando; stipite cylindrico tenui laccato sursum compresso dilatato; hymenio albedo; poris punctiformibus; contextu albo. Spruce, n. 53.

HAB. Panuré, with n. 205.

Pileus $2\frac{1}{2}$ inches across, orbicular, very deeply umbilicate, hard, woody, though rather thin, opaque brown, nearly even, painted with numerous darker zones. Stem $4\frac{1}{2}$ –6 inches high, $\frac{1}{4}$ of an inch thick, straight, laccate, deep red-brown, dilated at the apex and compressed. Hymenium concave, nearly white; pores punctiform, abruptly ending where the stem enters the pileus.

The above is described from the most perfect specimen, which was placed with n. 205, a very different species. Under n. 53 was sent another specimen, with a lateral pileus, but with the stem remarkably dilated above; so different however in general appearance that it might easily have been considered as distinct, though an attentive examination shows its identity with the other.

553. *P. (Mesopus) diabolicus*, n. s.; pileo crassiusculo rigido umbilicato depresso, primum subtiliter velutino, cito glabrescente, margine primum integro, demum crenato lobato; stipite cylindrico sublaccato lævi, disco orbiculari affixo; hymenio brunneo postice libero; poris punctiformibus. Spruce, n. 195.

HAB. On dead trunks. February, 1853. Panuré.

Pileus 4–6 inches broad, umbilicate, depressed, at first minutely velvety in the centre, but soon becoming smooth and shining, deep bay, sometimes producing new pilei from its surface, entire or strongly lobed and crenate; edge in young specimen erect, but afterwards arched. Stem 3 inches or more high, $\frac{1}{2}$ inch thick, of the same colour as the pileus, with a smooth, rigid, almost laccate cuticle, firm, solid, cylindrical. Hymenium dark umber, free behind and separate from the stem; pores punctiform, very minute.

Allied to *P. varius*, but most distinct.

554. *P. (Mesopus) rufo-atratus*, n. s.; pileo tenui orbiculari umbilicato pruinoso velutino glabrescente radiatim lineato rufo; stipite tenui; hymenio pallido; poris punctiformibus. Spruce, n. 196.

HAB. On decayed trunks of trees. Panuré.

Pileus $1\frac{1}{2}$ inch broad, at first reddish umber, clothed with short, pale, velvety pubescence, then smooth, deep red-brown, umbilicate,

marked with radiating lines. Stem slender, 2-3 inches high, 1 line thick, irregular, here and there nodulose, nearly black. Hymenium pale; pores punctiform, ending abruptly round the swollen tip of the stem; interstices plane.

Differs from *P. diabolicus* in its slender habit, thinner pileus, more slender stem, which is not attached by a disciform base. It is closely allied but certainly distinct.

555. *P. (Mesopus) vernicosus*, n. s.; pileo orbiculari umbilicato atrofusco vernicoso polito radiatim lineato; stipite gracili atro; hymenio brunneo; poris apice contractis interstitiis depressis. Spruce, n. 50.

HAB. On decayed trunks. Panuré.

Pileus about 2 inches across, umbilicate, moderately thick, rigid, dark rufous, with an indistinct zone, shining as if varnished, marked with radiating lines; edge thin, lobed or crenate. Stem slender, $1\frac{1}{2}$ inch high, 1 line thick, rigid, black. Hymenium brown; pores decurrent but ending abruptly; orifice contracted; interstices depressed.

Evidently allied to the foregoing species, but differing in the varnished pileus and contracted pores.

* *P. (Mesopus) oblectans*, Berk., Hook. Lond. Journ. vol. iv. p. 51. Spruce, n. 15.

HAB. On dead wood. Panuré.

Besides the ordinary form there is one on a far larger scale. Pileus 2 inches across. Stem $3\frac{1}{2}$ inches high. Beautifully velvety.

One individual from Ceylon is nearly as large.

556. *P. (Mesopus) luteo-nitidus*, n. s.; pileo rugoso luteo sericeo-nitente irregulari-lobato crebri-zonato primum subvelutino; stipite deformi spongioso-vestito; poris punctiformibus luteo-olivaceis. Spruce, n. 51.

HAB. On the ground. Panuré.

Pileus 2 inches across, convex, orbicular, sometimes depressed, yellowish at first, finely velvety, then shining with a sericeous aspect, irregular, rugose, lobed. Stem 2 inches or more high, $\frac{1}{3}$ - $\frac{1}{2}$ an inch thick, often compressed, clothed with spongy down of the colour of the pileus. Hymenium olive-yellow; pores decurrent, punctiform.

In the style of *P. tomentosus*, but very distinct. Occasionally the stem is divided above proliferously.

557. *P. (Pleuropus) passerinus*, n. s.; pileo primum spatulato-fabelliformi rubro-badio nitido demum connato-cupulæformi umbrino;

stipite gracillimo ; hymenio ex albo umbrino ; poris minutissimis. (Tab. X. fig. 2.)

HAB. In Caatingas. Panuré.

Pileus 1-2 inches across, at first spathulato-flabelliform, then truly flabelliform, and at length cup-shaped from the confluence of the edges, deep bay, shining, nearly even. Stem 8 inches or more high, not a line thick, irregular. Hymenium at first white, then umber ; pores $\frac{1}{32}$ of an inch across, subhexagonal.

Allied to *P. renatus*, which has larger pores. In both the pores seem tender. (Tab. X. fig. 2. *P. passerinus*, nat. size.)

558. *P.* (Pleuropus) *macer*, n. s. ; pileo reniformi rigido coriaceo hepatico subzonato ; margine integro ; stipite elongato umbrino pruinoso sursum nigrescente ; hymenio concavo brunneo ; poris punctiformibus, tramâ sulcatâ ; contextu pallido subluteo.

HAB. Panuré.

Pileus $1\frac{1}{4}$ inch across, reniform, entire, rigid, coriaceous, deep liver-coloured, smooth, with two or three zones ; substance pallid, inclining to yellow. Stem 9 inches high, 2 lines thick, umber, pruinose, becoming black or bay above, especially at the apex. Hymenium concave, brownish ; pores punctiform, ocellate. Trama slightly sulcate.

This is evidently distinct from *P. ocellatus* in its yellowish not reddish substance, and other points. Unfortunately there is but a single specimen.

559. *P.* (Pleuropus) *pallidus*, n. s. ; pileo suberoso convexo reniformi pallido zonis crebris notato ; stipite laterali umbrino pruinoso ; hymenio leviter umbrino concavo.

HAB. On dead wood. Panuré. Spruce.

Pileus 3 inches across, hard, corky, reniform, convex, pallid, marked with numerous darker zones ; margin obtuse, nearly entire. Stem 2 inches high, $\frac{1}{3}$ of an inch thick, rather irregular. Hymenium of the same colour as the pileus.

A beautiful species, resembling *Polyporus Camerarius*.

560. *P.* (Pleuropus) *brunneo-pictus*, n. s. ; pileo convexo reniformi radiato-rugoso brunneolo zonis crebris sulcisque concentricis picto subsericeo ; stipite laterali umbrino pruinoso sursum dilatato ; hymenio pallide umbrino-brunneolo ; contextu cinnamomeo. Spruce, n. 55.

HAB. On dead wood. Panuré.

Pileus 2 inches across, reniform, convex, corky, slightly radiato-

rugose, brownish, painted with many darker zones, which are sometimes deeply impressed; substance cinnamon-coloured. Stem nearly 3 inches high, $\frac{1}{8}$ of an inch thick, compressed, straight, slightly uneven, umber, pruinose, strongly dilated above. Hymenium concave, pale brownish umber, distinctly defined all round the dilated apex of the stem. Apices of tubes papular, with a central aperture.

A very beautiful Fungus, allied to *P. pallidus*, but with many distinct characters.

(To be continued.)

BOTANICAL INFORMATION.

MR. SPRUCE in Peru.

By letters recently received from the enterprising botanist and traveller Mr. Spruce, dated December 25, 1855, we find that he has reached Tarapoto, on the Huallaga, in Peru. His immediately previous letters were from Yurimaguas, "from which place," he writes, "I did not get away till the end of June, and on the 21st reached the end of my long voyage. Yurimaguas has the most equable temperature I have anywhere experienced, the thermometer sometimes not varying more than 3° in twenty-four hours; but I have found no place so relaxing, and the addition of a severe attack of diarrhœa and catarrh had reduced me pretty low when I left. Periodic returns of this diarrhœa and ulcerated feet, caused by walking in the cold water of mountain streams, are the chief inconveniences I have experienced at Tarapoto. In other respects I am more agreeably placed than anywhere previously in my South American wanderings. I am among magnificent scenery and an interesting vegetation, and there are a few pleasant people with whom to converse. The pampa, or plain, of Tarapoto is a sort of amphitheatre, entirely surrounded by hills, and so large that London might be set down on it; its position is in the lower angle of the confluence of the Mayo and Huallaga, and the town itself is about three leagues from the latter river. The hills are an offshoot from the main ridge of the Andes, and, from being watered by the Mayo and its tributaries, I must call them, for want of a better name, the Mayensian Andes. The ridges rise to some 3000 feet above the Pampa, and some

points are probably much higher. In a future letter I may perhaps sketch more minutely the geographical and other features of Tarapoto. Good botanizing ground is unfortunately rather distant. The Pampa either is or has been wholly under cultivation, with the exception of the precipitous banks of the rivulets, and it is a long way across it to the foot of the hills. The summits of the hills have most of them never been reached, and they are clad with the same dense forest as the Amazon, showing rarely scattered bald, grassy places, called 'pajonales' or 'pastos.' Where there are no tracks one must ascend by the beds of the streams, all of which, including the Huallaga, have the peculiarity of being, as the Peruvians say, boxed in (*encajonado*) between steep walls of rock, where they issue from the hills. These steep narrows are called 'Pongos,' and often include falls and rapids; they are rich places for Ferns, but it is both difficult and dangerous getting along them, now and then scrambling over large slippery rocks which block up the passage, or wading up to the middle through dark holes, with the water below 70°. An exploration of one of these places generally costs me a week's suffering in the feet. I have at last got into a Fern country, and have already gathered more species than in all my Brazilian and Venezuelan travels. Mosses also are more abundant, and there is a greater proportion of large species. Among the flowers I believe you will find a good share of novelty. I expect I have two new genera of *Rubiaceæ*, both very fine things, one of them allied to *Calycophyllum*, but with large flowers, almost like those of *Henriquezia*. There are new things also in several other tribes. The general character of the vegetation is, as might be expected, intermediate between that of the valley of the Amazon and of its alpine sources. As evidences of an approach to cooler regions, and to a Flora more European in its affinities, I may mention having met here, for the first time in my American travels, a Horsetail, a Poppy, a Bramble, a Crosswort, and a *Ranunculus* (a minute species, trailing over moss by mountain-streams, and looking quite like a *Hydrocotyle*). The Ferns may possibly include some new species, especially among the larger ones, which are likely enough to have been passed over on account of their bulkiness. The fronds of one of these are twenty-two feet in length, though it never shows more than a rudimentary caudex; its affinity seems to be with *Cyathea*. In my collection are a good many species of *Grammitis*, *Meniscium*, *Davallia*, *Diplazium*, *Litobrochia*,

Aneimia, etc., together with several pretty *Selaginellas*, and an Adder's-tongue. A small species of *Grammitis*, growing on trees in the mountains, is very odoriferous when dry, and the Indian women put it in their hair, calling it *Asinúma*.

“ These things have not been got together without greater trouble than I had calculated on. I expected to find roads on which I could take long journeys with mules ; but though there are a few mules, there are no roads on which they can be taken with cargoes. Between Moyobamba and the Huallaga all cargoes must be carried on Indians' backs, and indeed throughout the eastern slope of the Cordillera the roads rarely admit of any other mode. The number of Indians is constantly diminishing, and barely suffices for the ordinary traffic of the district. I have ridden a few times across the Pampa to the hills ; but for longer excursions this mode does not suit. The journey alluded to at the opening of my letter was to visit a mountain lying beyond the Mayo, at two days' journey from Moyobamba and three from Tarapoto. It is called the Campana, from some fancied resemblance to a bell, and the road crosses it at about 3500 feet* (by barometer) above the plain of Tarapoto ; but there is a peak to northward of the pass rising 1000 feet higher. It differs notably from the adjacent mountains by being nearly all *Pasto*, only the valleys and ravines towards its base being filled with forest, in which abundance of Palms are conspicuous. The only habitation there is a *chacra* on the side next Moyobamba, at 1500 feet below the Pass, and with no other dwelling nearer than a day's journey. Here I established myself with a stock of paper and with provisions for three weeks, which I had taken the necessary precaution of carrying with me from Tarapoto. My cargoes loaded five men on the way thither and six on the return. I have reason to be satisfied with my success at the Campana ; and I should probably have brought away more specimens, had not my host, a few days after my arrival, been severely bitten by a snake, the cure of whom prevented my leaving the house far for several days.

“ I have been most put about here for materials of which to make boxes, as such things as boards are not to be had. The only use the inhabitants have for a board is to make a door ; and this is either cut out of some old canoe or they cut down a tree in the forest, roughly carve out a door from it on the spot, and bring it home on their backs.

* Perhaps 5000 feet above the sea, but I have no barometric readings below the mouth of the Rio Negro.

For other purposes, such as benches, shelves, bedsteads, etc., the never-failing *Cáña brava* (*Gynerium saccharoides*) is all they require. After trying in vain to buy boards, I went to two posts on the Huallaga, and in each of them bought an old canoe. I had then to go again with a carpenter to cut them up into pieces of a convenient size, which had to be conveyed to Tarapoto on Indians' backs, and afterwards laboriously adzed down into something like boards. All this, with the trouble of looking up Indians, the making of two boxes and preparing boards for other two, left me little leisure for anything else for the space of near a month.

"Supposing that all is right, I propose extending my stay at Tarapoto to a little over the twelvemonth, say to somewhere in August. I shall thus be able to gather a few things which illness and fatigue obliged me to leave at the time of my arrival. I have been on the top of three mountains, and their vegetation is so nearly identical that I should hardly find work at Tarapoto for a second year. Mathews was five months at Tarapoto, where he is said to have gathered very few plants, and only in the Pampa. Moyobamba he was accustomed to visit every year, but Chachapoyas was his residence. I have endeavoured to explore the places which I know he did not, but I cannot expect much novelty if I follow his track to the Cordillera. There are three courses open to me from Tarapoto; one is to go towards the coast (by Moyobamba, Chachapoyas, etc.), which, for the reason just mentioned, is not to be thought of; the second is to ascend the Huallaga to Huanuco, a perilous voyage of from four to six weeks, where every year numbers of cargoes are lost, and only light goods can be taken. The immediate vicinity of Huanuco is all cultivated; but the highest mountains of Peru are accessible from thence, and the frigid lake of Lauricocha, the source of the Amazon; but I presume this district has been much explored, as it is far more easily reached from Lima than from here. The last course is to descend the Huallaga, and then (unless I go direct home) ascend to Quito either by the Pastaza or Napo. There is a Quitenian at Tarapoto who has several times made the voyage to Quito by both these routes, and who talks of going again next autumn. I am strongly inclined to accompany him, notwithstanding that I must thus again risk a painful and dangerous voyage. In five or six weeks from Tarapoto I could reach Hambato or Riobamba, whence to Quito is but a few days. By the Napo I

should be longer, as the ascent of this river alone takes two months. Nothing bulky could be taken either way, nor would it be necessary, as paper and everything else can easily be obtained at Quito. Notwithstanding so many travellers have visited Quito, I am certain it is still the most splendid station for a botanist in South America. Pichincha and the immediate neighbourhood have no doubt been well explored, but the eastern slopes of Cotopaxi, Tunguragua, etc., seem still unvisited, and it is such a fine thing to have head-quarters where every necessary can be promptly obtained. The mere circumstance of being where bread was abundant and cheap would make an immense difference in excursions of several weeks. Here there is neither bread nor farinha, but in their stead plantains, of which a man eats up all he can carry in three days.

“ My Cryptogamic collection is daily increasing in value, and at Quito would be doubtless much enriched. I should like to ascertain whether there would be a sale in England and on the Continent for forty sets of the *Cryptogamia* (Ferns, Mosses, Hepaticæ, Lichens, and Fungi) of Equatorial America at 30s. the hundred, the specimens being all carefully named. I intend to consult also Mr. Mitten (when I can find time to write to him), who I dare say would assist me in the distribution of the *Cryptogamia* in the same way as you do of the flowers. In the case of buyers being secure for these, it might be worth my while to make Quito my residence for some years. It would of course be optional to subscribers to limit themselves to certain tribes of the *Cryptogamia*. It is needless to add that I should continue to collect the most interesting *Phanerogamia*.

“ R. SPRUCE.”

NOTICES OF BOOKS.

GÉOGRAPHIE BOTANIQUE RAISONNÉE, ou Exposition des Faits principaux et des Lois concernant la Distribution Géographique des Plantes de l'époque actuelle; par M. ALPH. DE CANDOLLE. 2 vols. Svo. Paris.

(Continued from p. 157.)

Chapter 13 is devoted to the distribution of the species of a genus in the area occupied by the genus.

Chapter 14. On the Area or Extent of Surface occupied by Genera.

Chapter 15. On the Origin and Duration of Genera : and the changes that their habitats are undergoing at the present epoch.

Chapter 16. On the Geographical Position of Families : on their limits, and on the general character of the countries they occupy.

Chapter 17. On the Distribution of the Plants belonging to a Family in the area the family occupies, and on the comparison of different Families from this point of view.

Chapter 18. On the Area occupied by Families.

Much curious matter is introduced into several of the above Chapters, though the subjects to which they refer are not treated in the same manner or spirit that the previous ones are. They are all of too fragmentary a character to admit of any general conclusions being drawn from them ; they are also so much broken up into articles with different headings, under many of which the same kind of information is repeated in reference to the speciality of which the article treats, as to be rather confusing. In those especially devoted to the distribution of Natural Orders it appears to us that the extremely different opinions entertained by botanists as to the limits of the Orders themselves is an obstacle to any results being obtained, except from a tabulation of the genera and species of the whole vegetable kingdom upon two distinct plans ; one under the fewest Natural Orders under which they can be arranged, and the other under the greatest number into which they have been divided.

M. de Candolle, however, probably conceives that the usually accepted Natural Orders are capable of better limitation than we do. This is in accordance with his theory that genera are more natural assemblages of species than species are of individuals, and that the higher we ascend in the scale the better limited are the groups. Now, though it is very true that although in the present state of our knowledge the structural and physiological distinctions found to exist between Phænogams and Cryptogams are absolute, those between Monocotyledons and Dicotyledons very nearly so, and that Gymnosperms and Angiosperms are well structurally marked, we do not find that the Natural Orders of these great divisions are so well defined. It is true that they may be perfectly natural for the most part ; that is to say, that the osculant genera may be few ; but when few, they often embrace a host of species : and though it may be by but one genus that an Order is united with another Order, the majority of the genera in that Order

may be in the same relation to as many other Natural Orders. On the other hand, the limits between many of the most natural groups of plants are purely arbitrary, as has been repeatedly shown. Thus the irregular-flowered Monopetaleæ, *Scrophularineæ*, *Solaneæ*, *Acanthaceæ*, and *Cyrtandraceæ*, are all artificially divided in books, but in reality are united by numerous osculant genera; so are the regular-flowered families *Rubiaceæ*, *Loganiaceæ*,* *Caprifoliaceæ*, *Gentianeæ*, etc.; and again, the subclasses of *Compositæ*, *Rosaceæ*, *Leguminosæ*, *Saxifrageæ*, and of many others, are as well entitled to be called Natural Orders as any of the above.

In Cryptogams the same holds good to a greater degree. The families *Algæ*, *Lichenes*, and *Fungi* are truly natural, but there are no limits between them. Difficult as the species of *Polypodiaceæ* are to define, the genera have hitherto proved impossible; of Mosses the same holds true. The fact is, there appears to be no appreciable relation between the extent of the natural groups in the vegetable kingdom and the constancy of the characters that separate them. Whether species are originally distinct creations or not is as yet unproven, but there is no difficulty in proving that the greater majority of the generally-admitted genera and Natural Orders are, though natural assemblages, not limited by nature.

If we now turn to some of the examples given under the articles, it will be seen not only that this uncertainty vitiates the results obtained by M. de Candolle, but that his information upon the distribution of many Natural Orders is insufficient to draw conclusions from. Under the head of Families whose limits are very restricted sixteen are mentioned; of these *Rousseaceæ* consists of one genus and one species (con-

* In the case of *Loganiaceæ* especially, Mr. Bentham's Paper on this Order, read before the Linnean Society (March, 1856), proves that the affinities between all its genera and those of other natural families are so close, that its retention as a natural family is a purely arbitrary exercise of the systematist's prerogative, and that, paradoxical as it may appear, the several genera of *Loganiaceæ* are more allied to plants that are true members of *Rubiaceæ*, *Gentianeæ*, *Apocynæ*, etc., than these Natural Orders are to one another. It is because the genera of *Loganiaceæ* are more closely allied to each other than those other Orders (in which they find equally close allies) are, as a whole, to one another, that the Natural Order claims an independent position. In affirming that most Orders are, like genera, arbitrary creations of the systematists, we mean no more than that there is no evidence in the present state of our knowledge to the contrary; if the Natural Orders are absolutely definable, we are as far from having ascertained the philosophy of their distinctions as when Linnaeus first alluded to them or Jussieu classified them. Close observation and the study of development has done as much to break down some distinctive characters as to establish others.

fined to the island of Mauritius), which is included in the Natural Order *Breviaceæ* by Lindley and others; and *Breviaceæ* cannot be excluded from the Natural Order *Saxifrageæ* by any constant artificial or natural characters. The next Order is *Puniceæ*, which certainly should not be removed from *Myrtaceæ*. *Brunoniaceæ* again was considered a section of *Goodenovieæ* by Brown; *Leoniaceæ* consists of *Leonia*, which is truly a member of *Violariæ*; *Cyphiaceæ* is almost unanimously regarded as a member of *Campanulaceæ*; *Alangieæ* is certainly not distinct from *Corneæ*; *Calycantheæ* are scarcely distinguishable from *Rosaceæ*; *Rhizoboleæ* are included by some in *Guttifereæ*; *Aquilarineæ* are a section of *Daphneæ* in the opinion of some excellent botanists; and *Centrolepideæ* are only a section of *Restiaceæ*.

The object of the selection of sixteen made by M. de Candolle is to show, that there is a certain relation between the number of species a family possesses and the extent of the area it inhabits, the smaller Orders having narrow ranges; but, as we have seen, some of these Orders are not worthy of being considered as such; and further, some of these and of others have a wider distribution than he assigns to them, as *Aurantiaceæ* (which have several Australian and even South African genera, and apparently one American*), *Alangieæ*, *Aquilarineæ*, *Centrolepideæ*, *Epacridæ*, and *Monotropeæ*. It would further be easy to select more than sixteen groups, all very small, and as well or better entitled to be considered Natural Orders, which have very wide ranges, as *Cuscutæ*, *Ulmaceæ*, *Cassytheæ*, *Hernandieæ*, *Surianeæ*, *Basellaceæ*, *Chloranthaceæ*, *Scleranthaceæ*, *Elatineæ*, *Podostemaceæ*, *Saururaceæ*, *Triurideæ*, *Balanophoreæ*, *Rafflesiaceæ*, *Amyridæ*, *Nelumbiaceæ*, *Hydropheltideæ*, *Reaumuriaceæ*, *Rhizophoreæ*, *Avicenniæ*, *Pangiaceæ*, *Atherospermeæ*, *Betulaceæ*, *Hamamelideæ*, *Callitrichaceæ*, *Empetraceæ*, *Cycadeæ*, *Typhaceæ*, *Lemnaceæ*, and indeed many others.

Amongst Monocotyledons, of which M. de Candolle says that no family is so limited as those of the Dicotyledons he mentions, there are *Apostasiaceæ*, *Philesiaceæ*, *Gilliesiaceæ*, *Philydreæ*, *Cyclantheæ*, *Phytelapheæ*, *Nipadeæ*, all of which are as entitled to rank as natural families as those mentioned, though we do not allow them all that rank, and which are very limited in number of species and in range too.

The above observations are not put forward to disprove M. de Candolle's conclusions, but to show that they are based upon insufficient

* See *Casimiroa*. Seemann, in *Voy. Herald*.

data, and that these chapters are not all treated in the same manner or spirit that the previous ones are.

BOOK III. Botanical Geography.

Chapter 20. The opening chapter discusses the characters of the vegetation of a country under a series of articles; the first of them is devoted to the nature of these characters, considered by themselves.

1. *Characters relating to the classes*, treats of—1, the proportion of Phænogams to Cryptogams; this inquiry is pronounced to be very useless* in the present state of science;—2, that of Dicotyledons to Monocotyledons is, we are informed, little better worth attention, owing partly to causes which M. de Candolle considers to be overlooked by authors who are ordinarily very judicious;† as because the numbers of *Cyperaceæ* and *Gramineæ* in cold countries, and of *Orchideæ* in hot, are not usually well ascertained; because the proportion of Monocotyledons is smaller in a large area than in a small part of that area (owing to the greater extension of the species of Monocotyledons); and because the Monocotyledons belong to very different Families in different parts of the world.‡

2. *On the proportions of groups of greater value than Natural Orders, and less than Families*.:—This inquiry is also considered to be of little value.

M. de Candolle justly remarks that it is of high importance to ascertain the relative amount of herbaceous and woody plants in a Flora; of annuals, biennials, etc., and of other characters, such as succulence, persistence of foliage, and number of plants with compound leaves,|| because all these give a character to every vegetation. The desirability

* This unqualified denunciation of what has appeared to many of the first botanists of the day a curious and interesting subject of inquiry, rather takes us by surprise. That the numerical relations of Cryptogams to Phænogams often affords a most striking illustration of corresponding differences in climatic conditions, is of itself sufficient proof of the subject having some interest.

† These causes, though put forward as if new, are by no means so; all of them have been discussed in works relating to the subject in question, and some of them are so trite and obvious to any observer, that it is going too far to suppose them overlooked where they are not put forward.

‡ The force of this objection we cannot at all perceive, nor why a similar one should not be applied to Dicotyledons.

|| The amount of plants with compound leaves we hold to be, in this point of view, very immaterial, though so insisted upon by some naturalists; they rarely give a character to the vegetation, and, except in individual cases, the traveller cannot tell, at a few yards' distance, whether a tree has simple or compound leaves.

also of statistical tables, showing the proportions of forest, tilled, marsh, grass, etc. land, we also entirely concur in, but cannot regard it as strictly, and in detail, a branch of Botanical Geography. With regard to the classifications of plants under certain forms, proposed by Humboldt and carried out further by Meyen, they are of little service; for, however useful they appear to those who confine their attention to individuals in herbaria and gardens, they are found to be useless in practice to a much greater degree than is commonly supposed.

3. *Characters relating to Natural Orders.*—The calculations usually made to determine the proportion of species in a Family, necessarily supposes, we are told, that the species of different Families are equally abundant in individuals in the same country.* In this and in the three following sections, devoted to characters relating to the genera, to the species, and to the uniformity or variety of the vegetation of a country, M. de Candolle dwells almost wholly upon the exceeding vagueness of the inquiry, the multitudes of sources of error, and the small value of the results. In the main he is no doubt right; but when he says, under the article, "On the relative value of characters of vegetation," that he dissents from the opinion of certain botanical geographers, who deem it expedient to commence by giving numerical data, because "exact methods" only satisfy him, and because exactitude does not always consist in employing figures instead of words, but in giving to every fact and every point of view its true value, we are tempted to ask, where is the exactness of the methods employed by M. de Candolle in determining climatic conditions? and above all, what are the values of the figures employed in the articles devoted to the areas occupied by species, genera, families, and classes? what indeed does any branch of the subject of Botanical Geography consist of, but vague hypotheses, and a collection of facts of unknown value and application? Moreover M. de Candolle appears here to confound unnecessarily two very different subjects of inquiry, which are never supposed, by inquirers of ordinary intelligence, to have even a relative

* This does not appear to us to be the case; all these methods of ascertaining relative proportions are confessedly extremely imperfect, nor have authors regarded them as affording anything but rude approximations to truths. That laws regulating the proportions of the Families, etc., do exist, no one will deny; and the reason of these attempts to ascertain them by laborious calculations being of less absolute value than would be wished, lies in the fact that Botany is not an "exact science," and that Botanical Geography is one of the loosest branches of it.

value, and between which he himself elsewhere discriminates : these are, the numerical proportions of the species and Natural Orders, which afford strictly the botanical features of a country; and the relative number of individuals, and their habits and appearance, which determine the physiognomy of its vegetation. Different classes of naturalists, and above all, naturalists with differently constituted minds, will attach more or less importance to one or other of these subjects; and the fact of the first not satisfying M. de Candolle's love of the exact, or rather of its not fulfilling his idea of what is exact, is rather to be attributed to his not taking the same interest in one branch of speculative inquiry, which he does in others equally barren of direct results, and equally exposed to innumerable sources of grave error. Were it not that no amount of prospective labour has deterred M. de Candolle from the full and complete investigation of the earlier-treated subjects in his work, we should be inclined to suspect that the complexity of the phenomena, the difficulty of correlating the principal facts, and the multiplicity of detached observations requiring investigation, had influenced his judgment as to the relative value of this branch of the inquiry, and of those that precede it.

Chapter 22. On the comparison of the relative proportion of Monocotyledons to Dicotyledons in different countries.—Under this subject (which however is considered as of doubtful importance) M. de Candolle gives a tabular statement of the number and proportions of Dicotyledons and Monocotyledons in sixty-eight different countries. This is a document of great value, however little it may be available in the present state of our knowledge for solving the problem for which it is collected and arranged. The principal laws deduced from it are, that in temperate regions the proportion of Monocotyledons decreases relatively to the Dicotyledons in approaching the tropics; and that, *ceteris paribus*, Monocotyledons prevail relatively to Dicotyledons in humid countries, and the reverse in dry countries. A very careful investigation follows of the available data for determining the same proportions in mountain countries, and some good observations on the results of comparing mountain regions with analogous climates in this respect.

In concluding the chapter M. de Candolle repeats that he finds it impossible to attach any real importance to the proportions presented by the two great classes of flowering plants, not only for the reasons

previously given, but because these proportions depend upon different laws, sometimes of one kind, sometimes of another, sometimes general, sometimes local. This last objection appears to us to apply to every branch of the study of Botanical Geography; whilst the very fact that Monocotyledons are, as compared with Dicotyledons, more widely spread, more variable as species, more difficult of association in limitable genera, and more difficult of distribution into Orders characterized by structural or physiological characters, demands the closest investigation of the local and general conditions of the countries in which they appear in unduly great or small proportion, relatively to the Dicotyledons. The first step to be made in such an inquiry is undoubtedly to ascertain their numerical proportions. It matters not that the class of Monocotyledons is represented by very different genera, or even Orders of plants, in the different countries which afford data to start from, for the variable element is everywhere present, and in a greater degree amongst Monocotyledons than Dicotyledons.

Chapter 22. On the comparison of different countries with respect to those Natural Orders which abound most in Species.—For this investigation M. de Candolle has collected an invaluable series of tabulated materials, at great labour, for which alone he merits the thanks of his fellow-botanists. Upwards of 130 general and local floras have been submitted to analysis, and the proportions of the seven or eight largest Natural Orders contained in each are given, which, on the average, include half the Phænogamic plants in each Flora. The naturalized plants are (we think unfortunately) included; on the one hand, it would have been difficult to have eliminated them perfectly; but on the other, their introduction has sometimes led to the most serious errors. Thus the flora of Ascension, which numbers only 4 or 5 native flowering plants, is represented as containing 39, many of the additional species not being even naturalized, but garden plants; whilst, instead of taking Roxburgh's list of St. Helena plants (in Beatson's Tracts), which includes about 30 species and is a very near approach to the truth, that of Antomarchi is preferred, as "*la moins pitoyable des quatres Flores publiées jusqu'à présent*," and of which all we can say is, the least contemptible is the most ridiculous.

There are two sources of difficulty in the investigation of the Floras analyzed in this Chapter, which are quite inseparable from the subject in the present state of our knowledge, and which are, firstly,

the widely different local conditions of many of the areas, and especially the presence of lofty mountains in some; and secondly, the extremely different views taken by the authors of the several Floras, of the value of specific characters. Thus, Ledebour's estimate of the Flora of Dahuria, Baikal, etc., at upwards of 1336 flowering plants, is manifestly founded upon ideas of species which are totally incompatible with those of Beck, who estimates the Flora of the Northern and Middle United States at 2125, or of Georgia and South Carolina at 2158; and in general we may remark that the North American botanists take a much wider, and, we think, a more philosophical view of the value of specific characters than many European botanists do. We should also have preferred Watson's corrected estimate of the real number of indigenous British plants, to that adopted, which includes a number of plants whose claims to be considered as species or as British nobody vindicates. On the other hand, any comparisons founded on a collection of only 305 New Guinea plants (an archipelago which must contain upwards of 3000), and in which collection the *Orchideæ* are almost five times more numerous than the *Rubiaceæ*, and three times more numerous than the *Leguminosæ*, and in which 14 Orders, including *Scitamineæ*, *Sapotææ*, and Palms, all appear as more numerous than the *Compositæ*, which latter Order has, further, fewer than seven species, are manifestly adapted to mislead.*

We do not mention these points as objections to the tables being introduced, nor because we suppose M. de Candolle to be ignorant of them, but because we consider that they are sources of greater inexactness in the method, and introduce graver errors into the results, than those causes which, he says, render the inquiry into the relative proportions of Dicotyledons and Monocotyledons almost useless.

Under the head of the number of families in a country to which half the species it contains belongs, the general law is given, that the richer a Flora is in species, the greater the number of families which must be enumerated, commencing with the largest, before half the number of species is included; in other words, the richer the Flora the greater the number of Natural Orders.

Chapter 23. On the comparison of different countries as regards their most characteristic Natural Families.

* In another place we find it stated without a qualification that the *Orchideæ* form sixteen per cent. of the Flora of New Guinea; and the *Compositæ* fifteen per cent. of that of Ascension, where we know there is not one native species of the Order.

A Natural Order may, M. de Candolle remarks, be characteristic in two senses,—by containing an unusually great number of species as compared to what other countries do, or by containing a great number as compared with the other Natural Orders in the same country; and he treats the question under both aspects. To tabulate his materials he divides the globe into thirteen regions, which are considered natural. These are—1, the North Polar, or Arctic; 2 and 3, the North Temperate regions of the Old and New World; 4 to 7, tropical America, Africa, Asia, and Polynesia; 8, New Holland and Tasmania; 9, New Zealand and adjacent islets; 10, South Africa; 11, Kerguelen's Land, the Crozets, etc., and Tristan d'Acunha; 12, Chili, Buenos Ayres, and South Brazil; 13, Patagonia and the Falklands.*

Under these divisions the names of the Natural Orders eminently characteristic are enumerated.†

Chapter 24. On the variety of vegetable forms in different countries, and in the world at large.—An extremely valuable table is given, showing the ascertained and probable total number of species in nearly one hundred different countries, grouped approximately according to their areas, together with the latitude and area of each. The column of ascertained species apparently follows the highest estimates attainable, the British species being taken at 1520, and those of the Russian empire at 6366.‡ The estimated probable number of species is greatest for South Africa, amounting, according to Drege, from 16,000 to 20,000 in the countries including the Cape district and from the Gariep River to Port Natal, a number which so excessively exceeds that of any other country included in the list as to excite surprise, if not incredulity.

Under the head of "Comparison of the great divisions of the Globe," M. de Candolle states that America appears to have more species than any area of equivalent extent, which he attributes to the direction of its mountain-chains. Africa appears to be poor in species, except at its south extreme, where they are very numerous,—a circumstance he can only account for either by supposing that the Flora was originally that of a country with more marked differences of climates in its different

* Of these we should not regard the 1st, 7th, 11th, and 13th as at all worthy of being ranked as regions, and the 9th as doubtful.

† *Stachouseæ* are omitted in the Australian list; *Sapindaceæ* and *Begoniaceæ* can hardly be considered eminently characteristic of tropical America, considering how very many Asiatic species there are; *Antidesmeæ* are omitted in the tropical Asiatic Flora.

‡ A number which, as has been shown in this work, Vol. V. p. 320, is no doubt capable of very great reduction.

parts than it now presents; or by the intermixture of the Floras of adjacent islands with different vegetations, which have since disappeared.*

(To be continued.)

SYLLOGE GENERUM SPECIERUMQUE CRYPTOAMICARUM *quas in variis operibus descriptas iconibusque illustratas, nunc ad diagnosim redactas nonnullasque novas interjectas ordine systematico disposuit* C. MONTAGNE, D.M., etc. etc. Paris, 1855, 8vo, pp. xxiv. and 498.

We have here, in a fair and well-printed volume, an epitome of the numerous descriptions of new species of Cryptogamic plants which the Author has published during the last quarter of a century in the leading scientific journals in various countries, and in the reports of voyages of discovery instituted from time to time by the French Government. Many of these books are extremely expensive, and to be found only in public libraries or in the hands of persons of considerable means; and scientific journals are so numerous that no ordinary purse can secure the regular supply even of the most important. A large portion therefore of the Author's labours were hitherto available only at a considerable expense of time and labour; and even those who have had the good fortune to be in constant correspondence with the Author, and therefore to possess most of his Memoirs, will rejoice to have the whole digested in a compact form, easy of consultation from the scientific arrangement and the incalculable aid of an excellent index. No less than 1684 species, the greater part of which are new, are characterized in the volume, and some interesting notes and remarks are added occasionally, containing information on points either of particular or general interest. At the same time unavoidable errors are corrected, and the whole nomenclature and arrangement ordered according to the most recent information in each division; several new species also are now published for the first time, and amongst them the novelties contained in a very interesting collection of North American *Fungi*. The work cannot fail to be most welcome to every one interested in Cryptogamic botany; and we trust that the Author will be indemnified for the outlay attendant on his disinterested labours.

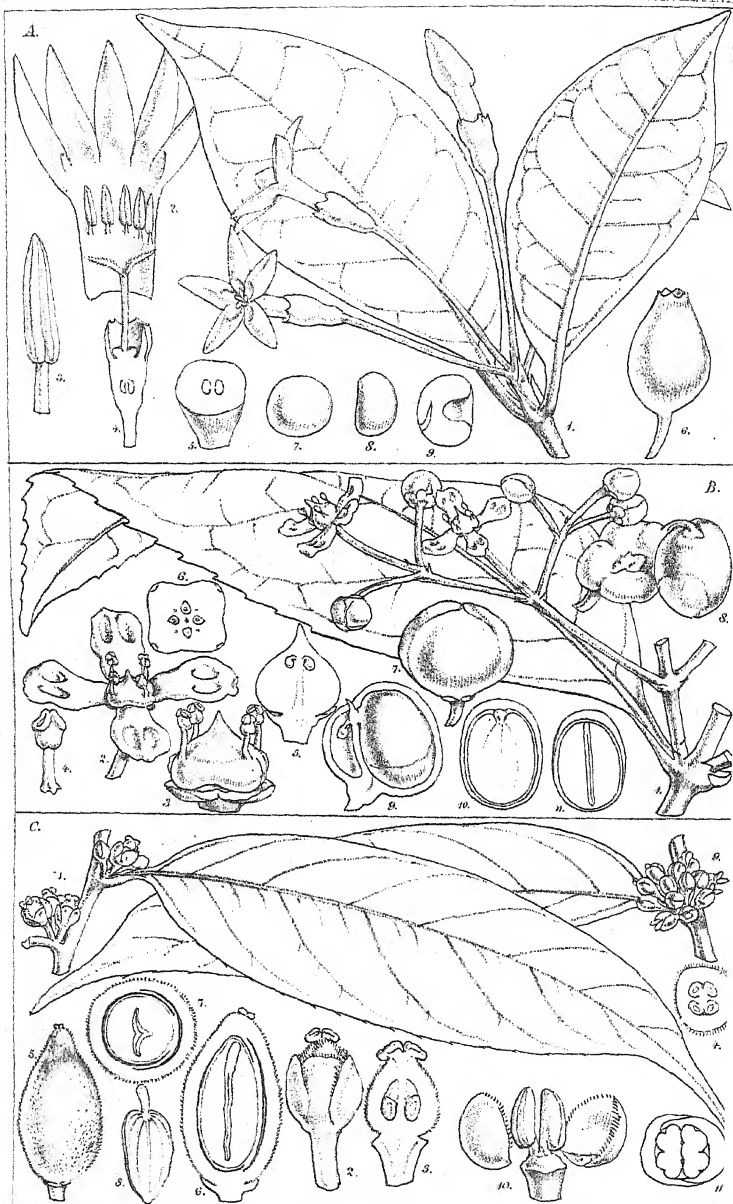
* M. de Candolle probably underrates the extent and elevation of the South African mountain-chains, and overlooks the fact that the eastern and western coasts of that country have markedly different climates, determined by the presence of periodic rains on the eastern side.

CHLORIS ANDINA; *Essai d'une Flore de la Région Alpine des Cordillères de l'Amérique du Sud*; par H. A. WEDDELL, M.D., etc. etc. Livraison II., 6 plates. 4to. Paris, 1855.

We have here the second Fasciculus of this charming work, with the same complement of well-executed plates as the former Fasciculus, by Riocreux, and often two and even three distinct plants upon one plate. With such admirable figures and analyses, brief characters and descriptions suffice; and they are worked out with great care. The *Compositæ* are here continued, and all published in the present number belong to the two groups which are so extensively represented in the South American Andes, the *Mutisiaceæ* and the *Nassauviaceæ*. The illustrations given are, Tab. VII., *Onoseris hastata*, Wedd. Tab. VIII., *a*, *Tylloma splendens*, Wedd.; *b*, *Bichenia reptans*, Wedd. Tab. IX., *A*, *Oriastrum pusillum*, Pœp. et Endl.; *B*, *Egania acerosa*, Remy. Tab. X., *A*, *Perezia cærulescens*, Wedd.; *B*, *Chabræa laciniata*, Wedd. Tab. XI., *A*, *Nassauvia revoluta*, Gill.; *B*, *Nassauvia spicata*, Remy. Tab. XII., *A*, *Nassauvia Remyana*, Wedd.; *B*, *Caloptilium Lagasæ*, Hook. et Arn.

TUINBOUW; FLORA van NEDERLAND en zijne Overzeesche Bezittingen, etc., door W. H. DE VRIESE. Vol. II. Leyden. 8vo, many Plates, coloured and plain. 1855.

We gave a favourable account of the first volume of this Work at page 96 of one of our early numbers for last year. The regular continuance of it through a second year is a sure sign of its being favourably received by the public; and no wonder, for it supplies a great amount of valuable information bearing upon Horticulture and Botany. Many of the plates are beautifully executed: we particularly allude to *Bilbergia Rohaniana*, De Vriese; a new *Phlox*, etc.; but there are some of another school, which are very inferior, viz. two Lilies, *Lilium coridion*, Sieb. et De Vriese, and *L. partheneion*, Sieb. et De Vriese, and *Fuchsia robusta*, Tengberg. Some botanical landscapes, which are copied from contemporary works, and which represent a Peruvian-Bark forest, the natural bridge of *Ficus elastica* in the Khasia mountains, and the scene on the Tambur River, Eastern Nepal, are very well reproduced. We are sorry our ignorance of the Dutch language prevents our profiting more from the copious descriptive matter in the pages.



DECADES OF FUNGI; by the REV. M. J. BERKELEY, M.A., F.L.S.

Decades LVII.—LVIII.

(With Plates V., VI., IX., X.)

Rio Negro Fungi.

(Continued from p. 177.)

561. *P. (Pleuropus) semiclausus*, n. s.; pileo rigido coriaceo flabeliformi sublobato umbrino zonis brunneis picto subsericeo, margine acuto; stipite laterali compresso; hymenio pallido; poris ocellatis; contextu ferrugineo. Spruce, n. 56, 200.

HAB. On decaying trunks. Panuré. February, 1853.

Pileus 2-4½ inches across, rigid, coriaceous, deep umber, slightly lobed, marked with many concentric zones, obscurely silky, lineato-rugose; substance ferruginous. Stem lateral, elongated or almost obsolete, very variable in length and thickness, umber, pruinose. Hymenium pale; pores ocellate; trama even or sulcate.

There are three different forms of this species, one with a slender stem and smaller pileus, which is nearly even or rugose; another with a broader pileus and stouter stem; and a third with a pileus attached by an orbicular disc, or even entirely stemless. These all agree in colour, substance, and pores, and I am therefore obliged to consider them as one and the same species. The species is moreover closely connected with *P. brunneo-pictus*, which exhibits the Porotheloid characters of the hymenium more certainly. In the present case the structure is the same, but every part of the hymenium does not show it equally.

562. *P. (Pleuropus) variabilis*, n. s.; pileo convexo coriaceo ex elliptico reniformi umbrino zonis brunneis picto sublævi; stipite elato umbrino pruinose; hymenio e plano concavo pallide umbrino; poris papillæformibus. Spruce, n. 57, 183, 207. (Tab. IX. fig. 1.)

HAB. On the ground in woods. February, 1853. Panuré.

Pileus ½-2½ inches across, convex, coriaceous, elliptic, and finally reniform, umber, with very few zones or beautifully banded with brown, nearly even or slightly undulated; substance pale. Stem 4-9 inches high, 1-3 lines thick, umber, pruinose, lateral, passing up to the apex of the pileus so as to leave the border in many cases quite free. Hymenium plane, then convex; papillæ distinct or only marked by wavy furrows, each little area enclosing several pores.

A variable, but very distinct species.

563. *P. (Pleuropus) hemibaphus*, n. s.; pileo reniformi suberoso brunneolo radiato-rugoso zonato; stipite valido umbrino pruinoso; hymenio albo concavo; poris minutis punctiformibus; contextu pallido.

HAB. On dead wood. Panuré.

Pileus 3 inches across, corky, reniform, radiato-rugose, opaque, brownish, zoned, zones sometimes impressed; margin nearly entire. Stem 2-2½ inches high, $\frac{3}{4}$ -1 inch thick, thickened at the base, umber, pruinose. Hymenium concave, pearly white, forming a little raised border all round; pores minute, punctiform.

This has the habit of *Porothelium rugosum*, and agrees with it in many of its characters; but the hymenium is very different, and the pileus is not so rugose.

564. *P. (Pleuropus) atro-purpureus*, n. s.; pileo reniformi radiato-rugoso sulcato-zonato atro-purpureo subtiliter velutino lineatoque; stipite elongato gracili irregulari fusco; hymenio concavo pallido; poris minutis.

HAB. On the ground. Panuré.

Pileus 1 inch across, reniform, convex, radiato-rugose, purple-black, finely velvety and striate, concentrically furrowed; substance umber. Stem 6 inches high, 1 line thick, rugged, forked at the tip. Hymenium concave, pale; pores minute, $\frac{1}{18}$ of an inch across.

A very beautiful species, of which there is unfortunately but a single specimen.

* *P. lucidus*, Fr. Ep. p. 442. Spruce, n. 48, 67, 79, 172.

HAB. On dead trunks of trees. November, 1852. Panuré.

A common species.

565. *P. (Pleuropus) pes-simiae*, n. s.; pileo furcato digitato crasso rugoso umbrino-laccato, lobis fertilibus subfiabelliformibus; stipite crasso cum pileo confluyente; contextu intimo umbrino, exteriori albo molliusculo; hymenio obliquo albo; poris punctiformibus. Spruce, n. 212.

HAB. On rotten trunks. Panuré. January, 1853.

Pileus 6 inches long, 5 inches broad, forked below, lobed, the lobes sometimes quite distinct, barren or fertile, sometimes proliferous, rugged, dark umber-brown, strongly laccate but not shining; margin of lobes barren, from which, at an obtuse angle, projects the true margin of the hymenium, which is darker, and zoned. Stem 1½ inch thick, dilated

upwards, confluent with the pileus, and similar in colour and substance. Hymenium oblique, white; pores punctiform, about 90 to the inch, with thick dissepiments.

This very strange Fungus, which I find it very difficult to describe, is well known to the Indians, who call it "Coatâ-pô," or Monkey's-hand, the Coatâ being a large black monkey. It resembles slightly that form of *P. australis* figured in Annals of Nat. Hist. vol. iii. tab. 8. It appears however to be a good species, though possibly not in its normal form, and at any rate not a form of *P. australis*.

* *P. Leprieurii*, Mont. Ann. d. Sc. Nat. sér. 2, vol. xiii. p. 203. Spruce, n. 202.

HAB. On dead trunks. Panuré.

* *P. (Pleuropus) picipes*, Fr. Ep. p. 440.

HAB. On trunks of trees. Panuré and San Carlos. August, 1853. 566. *P. (Pleuropus) nephridius*, n. s.; pusillus, tenuis; pileo glabro badio phlebophoro reniformi; stipite brevissimo nigro; poris minutis punctiformibus. Spruce, n. 164, 210.

HAB. On a dead trunk. Panuré, Guia. March, 1853.

Pileus $\frac{3}{4}$ –2 inches across, thin, coriaceous, reniform, red-bay, smooth; cuticle behind or over the whole surface, raised into vein-like excrescences. Stem very short, black, sometimes simply disciform. Hymenium pale; pores punctiform.

This is a small species, remarkable for the cuticle being reticulated like that of *A. phlebophorus*, as is the stem.

* *P. (Pleuropus) rhypidius*, Berk. Hook. Lond. Journ. vol. vi. p. 319. Spruce, n. 168.

HAB. On wood in forests on the banks of Rio Negro. March, 1853.

There is also a beautiful miniature variety of this species, not two lines broad, from the Amazon.

567. *P. (Pleuropus) decolor*, n. s.; carnosulus, albidus, siccus sordide umbrinus, pusillus; pileo flabelliformi glabro; stipite cum pileo confluyente; poris mediis subhexagonis; dissepimentis tenuibus. Spruce, n. 47.

HAB. On decayed trunks. Panuré.

Pileus 1 inch long, $\frac{3}{4}$ of an inch wide, rather fleshy, whitish, dirty umber and rigid when dry, then smooth, nearly even. Stem short, confluent with the pileus; pores subhexagonal, $\frac{1}{16}$ of an inch across when fresh; dissepiments very thin; edge minutely granulated.

A delicate species, approaching *Favolus* in characters.

* *P. (Pleuropus) sanguineus*, Fr. Ep. p. 444. Spruce, n. 187, 46.

HAB. The commonest Fungus on logs, in newly cleared ground, and near the houses. Panuré. February, 1853.

No. 46 is a bleached form, on dead stems of *Alpinia aromatica*.

* *P. (Pleuropus) mutabilis*, Berk. in Ann. of Nat. Hist. 1853. Spruce, n. 173, 176, 30.

HAB. On dead wood. Panuré.

In 176 the edge is so thin as to be reduced to the cuticle, which is lacerated, insomuch that the pileus appears ciliated.

* *P. (Pleuropus) luteus*, Nees, Act. Nov. vol. xiii. t. 4, fig. 2. Spruce, n. 19.

HAB. On dead wood. Panuré. December.

568. *P. (Pleuropus) porphyritis*, n. s.; tenuis coriaceus; pileo flabelliformi ochraceo-zonato purpurascente, margine tenui; stipite brevi subconcolore; hymenio pallido; poris minutis. Spruce, n. 182.

HAB. On dead trunks. Panuré. March, 1853.

Pileus 2 inches or more across, thin, coriaceous, flabellate or subreniform, very minutely tomentose, repeatedly zoned, tinged here and there with purple. Stem $\frac{1}{2}$ of an inch high, subcylindrical, attached by an orbicular disc, inclining to tawny, smooth. Hymenium pallid; pores minute, subangular; substance pale.

Allied to *P. luteus*, etc., but very different in colour and habit; almost the whole of the upper surface is more or less tinged with purple. Sometimes the pileus is elongated.

569. *P. (Merisma) polydactylus*, n. s.; pileo suberoso polydactylo umbrino zonis brunneis picto subvelutino, loborum apicibus orbiculari-dilatatis; hymenio albo; poris parvis subangulatis. Spruce, n. 59.

HAB. Amongst the roots of trees. Panuré.

Hard, corky. Pileus continuous, with the deeply rooting stem two to three times forked, so as to form fan-like divisions, the tips dilated, and forming beneath orbicular discs; umber-brown, fasciated to the base, minutely velvety. Hymenium white; pores small, $\frac{1}{16}$ of an inch, slightly angular.

This very curious species is certainly no monstrous form of any other in the collection; the dilated hymenia are very peculiar, resembling somewhat the expansions on the feet of the Gecko. With the exception of the hymenium, the lower part is fasciated like the upper.

570. *P. (Anodermei) nivosus*, n. s.; pileo crassiusculo convexo pos-

tice attenuato nivoso glabro azono; hymenio albido; poris minutis angulatis dissepimentis tenuibus. Spruce, n. 192.

HAB. On dead wood. Panuré. February, 1853.

Pileus 2 inches across, convex, moderately thick, attenuated behind, snow-white, smooth; substance white. Hymenium slightly discoloured; pores angular, minute, $\frac{1}{130}$ of an inch across; dissepiments thin; edge entire.

Distinguished by its snow-white, smooth pileus.

571. *P. (Anodermei) armeniacus*, n. s.; armeniacus; pileo dimidiato subconvexo crassiusculo rugoso tomentoso; hymenio concolori; poris minutis subpunctiformibus, acie subintegra. Spruce, n. 39, 191.

HAB. On dead trunks. Panuré.

Pileus $2\frac{1}{2}$ inches across, dimidiate, slightly convex, rugose, minutely downy, pale apricot-coloured, moderately thick. Stem none. Hymenium of the same colour as the pileus; pores minute, $\frac{1}{140}$ of an inch across, subpunctiform; edge nearly entire; substance tolerably compact.

572. *P. (Anodermei) detritus*, n. s.; albus; pileo convexo e pruinoso glabrato sulcato-zonato; hymenio planiusculo; poris minutis punctiformibus. Spruce, n. 43, 49, 191.

HAB. On dead wood. Panuré.

Pileus 2 inches or more across, convex, sometimes unguulate, pruinose, at length smooth with a satiny lustre, concentrically sulcate. Hymenium sometimes slightly concave, but plane in the most perfect specimens; pores distinct, punctiform; edge obtuse.

Mr. Spruce compares the most perfect form with No. 43, and I cannot distinguish them, though there is some slight difference. Taking No. 49 to be the type, the species is allied to *P. ochroleucus*, Berk. I am the rather inclined to think them identical because *P. anebus*, Berk., is perfectly analogous.

573. *P. (Anodermei) endothrix*, n. s.; unguato-subimbricatus; pileo extus badio fibroso velutino, intus zonato, fibroso-spongioso umbrino; hymenio griseo; poris parvis dentatis.

HAB. On the pales of Mr. Spruce's orchard. San Carlos.

Pileus 2 inches or more across, $1\frac{1}{2}$ inch long, unguato-subimbricate, very light, fibroso-velvety above, zoned within, consisting of an intricate mass of fibres, mixed with finer, umber, spongy tissue. Hymenium grey, with a purplish tint; pores small, $\frac{1}{70}$ of an inch across, shallow, toothed; dissepiments rather thick, rigid.

With the habit of *Trametes hydroides*, but allied to *P. trichomallus*, *funalis*, etc., from all of which it is very distinct.

574. *P. (Placodermei) petalodes*, n. s.; subcarnosus; pileo cuneato-flabelliformi castaneo zonato lineato rugoso; hymenio umbrino; poris angulatis, dissepimentis tenuibus, contextu albo. Spruce, n. 36.

HAB. On dead trunks. Panuré.

Pileus 3 inches across, 2 long, much attenuated behind, petaliform, red-brown, with numerous zones, rough, with multitudes of raised, radiating lines, smooth; substance white. Hymenium umber; pores minute, $\frac{1}{160}$ of an inch across, angular; dissepiment thin. In some lights the hymenium has an olivaceous tint.

A very beautiful species, allied to *P. zonalis*; both are extremely rigid. This is somewhat carnosus when fresh, as is probably the case with *P. zonalis*.

* *P. (Placodermei) zonalis*, Kön. Ann. Nat. Hist. vol. x. p. 375. Spruce, n. 68, 208.

HAB. On decayed trunks. Jauarité Cachoeira. Panuré.

575. *P. (Placodermei) martius*, n. s.; pileo pulvinato dimidiato atrosanguineo zonis pallidis notato glabro; contextu pallido senectute umbrino; hymenio pallido; poris punctiformibus.

HAB. On dead wood. Panuré.

Pileus 3 inches across, pulvinate, dimidiate, nearly even, smooth, deep black-purple, with pallid zones; substance pale, in age umber. Hymenium concave, pallid, umber when old; pores minute, punctiform.

A very singular species, remarkable for its peculiar colouring and minute pores, which separate it at once from *P. vulneratus*, Lév.

* *P. (Placodermei) fasciatus*, Fr. Ep. p. 471. Spruce, n. 58, 171.

HAB. On decayed trunks. Panuré.

* *P. (Placodermei) australis*, Fr. Ep. p. 464. Spruce, n. 570.

HAB. On trunks of trees. Panuré.

* *P. ignarius*, Fr. Ep. p. 466. Spruce, n. 213.

Var. *resupinatus*.

HAB. Panuré. January, 1853.

Altogether resupinate, extending a foot or more in length over the surface of the wood, with the border almost perpendicular, the surface here and there rising into rounded hills with deep valleys: sometimes weighing a stone.

* *P. (Placodermei) senex*, Mont. Ann. d. Sc. Nat. sér. 2, vol. v. p. 70. Spruce, n. 61.

HAB. On decayed trunks. Panuré.

576. *P. (Placodermei) scalaris*, n. s.; durissimus; pileo atro-purpureo scabro tomentoso sulcato-zonato scalari-triquetro; contextu spadiceo; hymenio rufo-umbrino; poris minimis punctiformibus stratosi, acie planâ. Spruce, n. 62, 199.

HAB. On dead trunks of trees. February, 1853. Panuré.

Pileus $2\frac{1}{2}$ inches across and 2 inches long, dimidiate, rising in several stages, sulcato-zonate, extremely hard, atro-purpureous, clothed with very short pubescence, collected in little scabrous tufts. Hymenium concave, reddish-umber; pores punctiform, with flat interstices; substance rich red-brown.

Allied to *P. phœus*, and remarkable for its rich black-purple tint, scabrous surface, and reddish-umber hymenium.

576*. *P. (Placodermei) inflexibilis*, n. s.; pileo unguato brunneo cristato-sulcato durissimo; contextu ferrugineo; hymenio umbrino; poris punctiformibus. Spruce, n. 52, 181.

HAB. On dead trunks. Panuré.

Pileus 2 inches across, deeply sulcate, the interstices crested and singularly recurved.

This species has hitherto occurred only in Borneo.

* *P. (Placodermei) licnoides*, Mont. Ann. d. Sc. Nat. sér. 2, vol. xiii. p. 204.

HAB. On dead trunks. Panuré.

577. *P. (Placodermei) atro-umbrinus*, n. s.; durus pusillus; pileo unguato atro glabro striato-rugoso subzonato; contextu umbrino; hymenio concavo umbrino; poris minutis ocellatis stratosi.

HAB. On dead wood. Rio Negro.

Pileus $\frac{1}{2}$ –1 inch across, unguate, black, slightly zoned, marked with minute, radiating, smooth, thinly laccate wrinkles; substance bright umber-brown, corky, zoned. Hymenium concave, umber; pores minute, punctiform, $\frac{1}{200}$ of an inch across; interstices depressed, orifice raised, edged with white, stratose.

A small and delicate species, which has no close ally.

* *P. (Inodermei) caperatus*, Klotzsch, Ann. of Nat. Hist. vol. iii. p. 391. Spruce, n. 23.

HAB. On dead trunks. Panuré.

578. *P. (Inodermei) aculeans*, n. s.; tenuis rigidus coriaceus; pileo dimidiato subflabelliformi brunneo zonato radiato aculeato subsericeo; contextu umbrino; hymenio albo; poris punctiformibus. Spruce, n. 188.

HAB. On dead wood. Panuré.

Pileus 2 inches across, $1\frac{1}{3}$ long, dimidiate, subflabelliform, thin, rigid, coriaceous, brown with darker zones, rough with radiating raised processes, with a slight silky lustre; edge acute, paler, passing into white; substance brownish, umber. Hymenium white; pores punctiform, $\frac{1}{100}$ of an inch across; edge obtuse.

Allied to *P. caperatus*, but with none of its velvety clothing. The pores in age lose somewhat of their white hue and brown umber.

579. *P. (Inodermei) vespilloneus*, n. s.; pileo tenui papyraceo reflexo stygio zonato radiato-lineato subsericeo; hymenio umbrino; poris minutis subhexagonis. Spruce, n. 177.

HAB. On dead trunks on the River Uaupés. February, 1853.

Pileus effused at first, orbicular, then confluent, several inches across, reflexed, thin, flexible, papyraceous, dark brown, zoned, marked with a few radiating lines, slightly silky; extreme edge rufous. Hymenium umber; pores subhexagonal, regular, $\frac{1}{80}$ of an inch across; dissepiments thin; edge entire.

Resembling somewhat *P. caperatus*, but much thinner and more flexible, with regular, subhexagonal pores.

580. *P. (Inodermei) xerophyllaceus*, n. s.; pileo tenui rigido coriaceo dimidiato e velutino glabro brunneo zonato rugosiusculo; hymenio brunneolo; poris punctiformibus. Spruce, n. 179.

HAB. On dead wood. Panuré.

Pileus 3–5 inches across, 2 inches long, thin, rigid, coriaceous, rather rugose, sometimes marked with little scabrous elevations, sometimes nearly even, brown, repeatedly zoned, sometimes blotched; edge acute; substance brown. Hymenium brownish; pores punctiform, minute, $\frac{1}{200}$ of an inch across.

This species has many points of resemblance with *P. Hostmanni* and *P. caperatus*, but the pores are far smaller than in either, and from the latter it differs in the velvety down disappearing far sooner: in external appearance it has much resemblance to the former.

* *P. (Inodermei) holosclerus*, Berk. Hook. Lond. Journ. vol. vi. p. 501. Spruce, n. 209.

HAB. On dead trunks. Panuré.

This species, when young, is clothed with yellow down like *P. Chrysites*.

* *P. (Inodermei) setiporus*, Berk. l. c. p. 505. Spruce, n. 71.

HAB. S. Gabriel.

(To be continued.)

Definitions of Rare or hitherto Undescribed AUSTRALIAN PLANTS, chiefly collected within the boundaries of the Colony of Victoria; by Dr. FERDINAND MUELLER, Government Botanist for the Colony of Victoria.

(Continued from p. 169.)

XXXVIII. MYOPORINÆ.

Pholidia, R. Brown. (Sect. Sentic.)

Leaves alternate. Calyx four-parted. Drupe bony, hard-beaked, with imperfectly divided cells.

138. *Pholidia divaricata*, F. Muell.; twigs spreading, spinescent, glabrous or with a row of white short hairs; axils of the leaves somewhat bearded; leaves glabrous, linear-oblong, blunt, gradually tapering into the base, entire; flowers axillary, solitary, nearly sessile; segments of the calyx narrow-lanceolate, long-acuminate, ciliated; corolla outside starry-velutinous, its upper lip with two very short lobes, lower one three-parted.

HAB. In bushy plains, subject to inundations, on the banks of the Murray River, the Darling, and Murrumbidgee.

An ornamental shrub, several feet high, with purple or white generally spotted flowers.

(*Sect. Eremicola.*)

Leaves alternate, deciduous. Calyx five-parted. Drupe dry, acuminate, with almost entirely divided cells.

139. *Pholidia polyclada*, F. Muell.; glabrous; branches and twigs spreading, not spinescent; leaves linear, somewhat channelled, blunt, entire, sessile; pedicels axillary, solitary, upwards thickened, longer than the calyx; axils glabrous; segments of the calyx nearly cordate, acuminate, with minute, ear-like appendages at the base, indistinctly ciliate at the margin; corolla outwards glabrous, very wide, surpassing many times the length of the calyx, upper lip bifid, lower one three-parted.

HAB. In sandy, loamy, desert plains at the junction of the Darling and Murray.

A shrub with intricate branches, about six feet high. Flowers large, white.

This species forms an intermediate link between *Eremophila* and *Pholidia*. To the same genus I refer also *Myoporum brevifolium* of Bartling.

XXXIX. SCROPHULARINEÆ.

140. *Anthocercis angustifolia*, F. Muell.; all over glandulously pubescent; leaves linear, flat, entire; pedicels of equal length with the calyx; segments of the calyx linear, acutish; laciniae of the large corolla lanceolate-linear, acuminate, nearly twice as long as the tube.

HAB. In stony glens near Mount Lofty, in South Australia; not frequent.

141. *Anthocercis myosotidea*,* F. Muell.; all over hirtellous, from short, gland-bearing hairs; leaves small, sessile, ovate, blunt, broader towards the base, unequally revolute; pedicels shorter than the hirtellous calyx; segments of the calyx semiovate, blunt, half as long as the tube; corolla half-exserted, with short, blunt lobes.

HAB. In gravelly sand-ridges on the Murray, but rare.

A species next to *A. scabrella*, but well marked by the short blunt corolla.

142. *Pæderota densifolia*, F. Muell.; stems procumbent, caespitose; leaves thick, perfectly entire, cymbiform-ovate, ciliolate, sessile, densely imbricated in four rows; flowers bibracteate, axillary and terminal, solitary, sessile; corolla twice as long as the calyx, glabrous, pink, the tube inside unbearded; capsule obcordate; seeds oblique-ovate, convex at the back.

HAB. On the highest rocky summits of the Munyang Mountains (6000–6500 feet).

A most remarkable herb, variable in the number of divisions of the corolla, and in their form. Since it does not agree in habit with the European species, it may become the type of a new genus (*Cymbophyllum*).

143. *Veronica Hillebrandi*, F. Muell.; stems short, erect or ascending, all over covered with short reclined hairs; leaves thick, on short petioles, somewhat rough, oblong or hastate-ovate, grossly and remotely serrated, truncate or rarely tapering at the base; racemes corymbose, axillary, few-flowered; bracteas ovate-lanceolate; segments of the calyx lanceolate-oblong; corolla large, white; capsules broad-obcor-

* Of close affinity with *Cyphanthera ovalifolia*, Miers.

date, slightly compressed, glabrous; seeds compressed-ovate, brown, wrinkled.

HAB. On barren ridges along the Coorong, and on limestone rocks around Lake Alexandrina.

144. *Euphrasia alsa*, F. Muell.; dwarf, annual; glandulously downy; leaves sessile, in outline ovate-cuneate, lacinate or pinnatifid; lobes of the leaves oblong or linear, blunt; spikes very short, few-flowered; calyx tubulose-campanulate, the lobes blunt, about as long as the tube; tube of the corolla hardly exerted, of equal length with the limb, the lobes of the lower lip emarginate, of the upper retuse; anthers scantily bearded, the cells of all short and equally spurred; capsule orbicular-ovate, in front densely ciliated, enclosed, much compressed, few-seeded.

HAB. Gregarious on the highest stony summits of the Munyang Mountains (6000 feet).

It differs by its annual root from all other Australian and Tasmanian species, by its almost equally spurred anthers from the European, by the bearded anthers from the South American, and respectively by the same characters from the New Zealand species. *E. Antarctica* and *revoluta* are nearest related to it.

XL. LENTIBULARINEÆ.

145. *Polypompholyx exigua*, F. Muell.; utricle ovate; leaves narrow-lanceolate or oblong, tapering into the petiole; scape filiform, one- to three-flowered; corolla rose-red; lower lip nearly horizontal, trifid, at least three times longer than the upper lip, its segments oblong-linear, blunt, the middle one larger, the lateral ones hardly longer than the spur, upper lip nearly erect, bipartite, with linear-subulate divisions; palate yellow, with an orange margin.

HAB. In mossy, peaty or boggy places at the Grampians, Serra and Victoria Ranges, and in South Australia at Echunga.

It differs from *Polypompholyx tenella* in its larger flowers, as also in the characters already pointed out.

XLI. POLYGONEÆ.

146. *Polygonum diclinum* (Sect. *Avicularia*), F. Muell.; suffruticose, glaucous, perfectly smooth; stems upright, many-branched; leaves linear, at both ends narrowed; stipules short, binerved, entire, smooth, laxly clasping; fascicles axillary, few-flowered; flowers diœcious, oct-

androus and trigynous, greenish, imbricate-bracteolate, cernuous; pedicels shorter than the five-parted, glandless calyx; caryopsis subglobose-trigynous, shining black, hardly rugulose.

HAB. On shifting sand-hills at the junction of the Murray and Murrumbidgee, and rarely at the Mitta Mitta.

XLII. CHENOPODIACEÆ.

147. *Blitum atriplicinum* (Sect. *Orthosporum*), F. Muell.; stems numerous, prostrate, simple, hardly streaked; leaves grey-green on both sides, alternate, petiolate, much spreading, hastate- or ovate-lanceolate, the upper ones narrow-lanceolate, all acute, tapering into the base, glabrous with evanescent papillæ; flowers densely glomerate; fruit-bearing calyx wingless, not baccate, imperfectly closed; lobes near the base gibbous; seeds hardly keeled, with a densely papillose pericarp.

HAB. In saline plains on the Rivers Murray and Darling, as also towards Lake Torrens.

148. *Anisacantha Kentropsidea*, F. Muell.; diffuse; much branched, all over villose-tomentose; leaves nearly flat, linear, acute; calyx tomentose, short, above the middle aristate; awns two, short, thin, nearly equal.

HAB. In the Murray and Darling Desert.

It resembles *Kentropsis diacantha*.

149. *Anisacantha bicuspis*, F. Muell.; much branched; leaves crowded, trigono-semiterete, acute, glabrous; calyx villose-pubescent, long, below the middle aristate; stamens five; anthers exserted; awns two, strong, somewhat unequal.

HAB. In saline plains in the neighbourhood of Lake Torrens.

150. *Anisacantha tricuspis*, F. Muell.; branches glabrous, streaked; leaves crowded, semiterete, acute, glabrous; calyx short, tomentose at the summit, above the middle aristate; awns three, unequal.

HAB. On the subsaline and sandy banks of the Murray River, subject to inundations.

Next to *A. erinacea*.

151. *Anisacantha quinquecuspis*, F. Muell.; branchlets glabrous, streaked, divaricate; leaves glaucous, nearly flat, lanceolate-linear, acute, glabrous; calyx short, villose-tomentose at the summit, above the middle aristate; styles three; awns five, very unequal.

HAB. In sandy, loamy plains near the junction of the Darling and Murray Rivers.

Allied to *A. muricata*.

152. *Kochia sedifolia*, F. Muell.; velvety from a pale grey toment; stem fruticose, erect, with numerous spreading branchlets; leaves short, crowded, alternate, clavate-semiterete, blunt; flowers generally solitary; wings of the calyx nearly glabrous, hardly longer than its velutinous disc, veined, flabellate, nearly all connate, at last red.

HAB. On the limestone banks of the Murray and Darling Rivers, and in dry, subsaline places towards Spencer's Gulf and Lake Torrens.

It differs from *K. brevifolia* not only in much more spreading growth, but also essentially in its velvet indument and in the partially separated wings.

153. *Kochia oppositifolia*, F. Muell.; covered with a grey, somewhat silky toment; stem dwarf, spreading, much branched; leaves short, opposite, generally crowded, triquetrous, acute, with nearly carinate backs; flowers mostly solitary; wings of the calyx glabrous, hardly longer than the thinly tomentose disc, veined, red, orbicular- or flabellate-reniform, disjointed.

HAB. In various saline places at Spencer's Gulf.

The opposite leaves distinguish it at once from the numerous other species.

XLIII. SANTALACEÆ.

154. *Choretrum chrysanthum*, F. Muell.; branches terete; twigs angular, not pungent; leaves almost persistent, lanceolate-subulate, at length somewhat deltoid; glomerules yellow, two- to five-flowered, on the top of lateral very short twigs; bracteoles three, subovate or roundish, ciliolate.

HAB. On low, scrubby ridges along the Avoca and Murray Rivers.

Not dissimilar to *Choretrum glomeratum*, from which, as well as from the few other already known species, it is easily distinguished by its golden flowers.

XLIV. PROTEACEÆ.

155. *Grevillea Victorice* (Sect. *Calothyrsus*), F. Muell.; tall; leaves subcoriaceous, undivided, long-lanceolate, rarely ovate, acute, short-mucronate, gradually tapering into the petiole, penninerved, veined, with slightly recurved margin, above smooth, beneath with branchlets and rachis grey-silky; racemes pedunculate, axillary and terminal, elongate, sometimes divided, drooping, their development centripetal; ca-

lyces three times longer than the pedicel, outside rutilous, silky, inside, below the middle, white-bearded; style long, exserted, glabrous or scantily hairy at the extremity; germen stalked, glabrous; stigma sublateral, ovate, slightly umbonate; follicle ellipsoid, thinly ribbed, glabrous.

HAB. Along the waters of the Buffalo Range, on the summits of Mount Buller and Mount Tambo, on the sources of the Mitta Mitta, at Mount Hotham and Mount Latrobe.

A truly majestic plant, when, by descending into the valleys, it assumes a height of twelve feet and more. In higher altitudes it becomes a dwarfer bush, with shorter, almost ovate leaves.

156. *Grevillea dimorpha* (Sect. *Calothyrsus*), F. Muell.; diffuse; branches angulate; leaves coriaceous, undivided, long, lanceolate or linear, acute, callously mucronate, almost sessile, trinerved, above smooth, on the recurved margins and the lateral nerves somewhat scabrous, beneath grey-silky; racemes fascicular, on very short peduncles; calyx almost three times longer than the pedicels, outside rutilous-silky, inside at the middle white-bearded; style long, exserted, together with the germen and its stipes perfectly smooth; stigma lateral, ovate, centrally umbonate.

Var. *a*, *latifolia*; leaves ovate or narrow-lanceolate, 2-4" long, 4-8" broad, rarely broader.

Var. *β*, *angustifolia*; leaves elongate, linear, 2-4" rarely 6" long, 1-1½" broad.

HAB. In the Grampians, Serra and Victoria Ranges, in barren, rocky places.

This splendid species bears much affinity to *Grevillea Victorice*; it is however readily distinguished by its thicker, subsessile, generally narrower leaves, with a distinct marginal, scabrous nerve, by its short racemes on an abbreviate peduncle, with rusty-brown rachis, by its smaller flowers, barbate inside nearly up to the limb, and finally by smaller follicles tapering into a longer stipes.

It flowers in the spring, not, as *Grevillea Victorice*, in the autumn.

157. *Grevillea Miqueliana* (Sect. *Lissostylis*), F. Muell.; erect; branches terete; leaves large, subcoriaceous, petiolate, lanceolate or oblong-ovate, entire, on the margin hardly recurved, above dotted-scabrous, beneath as well as the branches and rachis tomentose, pubescent, penninerved, and net-veined; racemes short, dense, many-

flowered, pedunculate, drooping, with centripetal development; flowers after the anthesis reclinate; calyx four or five times longer than the pedicel, red, externally grey-downy, inside below the middle white-bearded; style exserted, towards the summit puberulous, at last smooth; germen stalked, glabrous; stigma sublateral, ovate, a little umbonate; follicle oblique-ovate.

HAB. On the crest of the sterile wooded ranges near Mount M'Millan, and along the upper valleys of the Avon in Gipps' Land.

This rare and handsome species has been dedicated to the illustrious botanist Miquel, who, as he participates in the labours to elucidate the Australian plants, is so well entitled to this distinction.

158. *Grevillea confertifolia* (Sect. *Lissostylis*), F. Muell.; diffuse; twigs pubescent; leaves crowded, linear-subulate, even, short-mucronate, above smooth, beneath with the innovations silky; margins refract to the middle nerve, which is prominent on both sides; fascicules of flowers sessile, terminal, concealed by the leaves; calyx outside and its pedicel grey-silky, inside at the middle densely bearded; pistil hardly half an inch long, smooth, exserted; germen stipitate; stigma ovate, oblique-terminal, with central papilla.

HAB. On the subalpine summit of Mount William, and on rocky ridges towards Mount Zero.

This species resembles *Grevillea juniperina* and *G. riparia* (R. Br. Prodr. 377).

159. *Grevillea lobata* (Sect. *Eugrevillea*), F. Muell.; high, upright, many-branched; twigs spreading, angular, covered with a very thin, whitish indument; leaves in shape ovate, deeply laciniate, venose, with hardly recurved margin, contracted by a wedge-shaped basis into the stalk, above pale green, glabrescent, beneath tomentose, as are the branches; segments two or three on both sides, distant, lanceolate, mucronate, entire, rarely teeth-bearing; racemes dense, ovate, many-flowered, at length drooping; calyx outside as well as pedicels and rachis grey from an appressed indument, inside smooth; style long, exserted, with exception of the base smooth; hypogyne gland very short; stigma oblique-lateral, broad-ovate, centrally umbonate; germen and its stipes white-tomentellous.

HAB. In the desert along the Murray River, from Swan Hill to the westward.

Nearest to *Grevillea ilicifolia* (R. Br. Suppl. p. 21), but much taller,

upright, tomentum white, shineless, not silky, leaves deeper divided with distant segments, and flowers more numerous.

160. *Grevillea pterosperma* (Sect. *Cycloptera*), F. Muell.; upright; branches strict, holosericeous; leaves glaucous, somewhat rigid, narrow-linear, elongate, undivided or bitrifid, glabrescent, ending in a sphacellate mucrone, above convex, and manifestly striated; margins refract to the middle nerve, which beneath is very prominent; racemes alternately crowded at the end of the branches, elongate, dense-flowered; calyx outside, with pedicels and rachis, grey-pubescent, inside, together with the style, smooth; germen stipitate, tomentose; stigma ovate, oblique-terminal, centrally umbonate; folliculi globose-ovate, turgid, hardening, with short stipes, grey-tomentellous; seeds flat, ovate, even, all round winged with a thin membrane.

HAB. In the Mallee Scrub on sand-hills towards the junction of the Murray and Murrumbidgee.

Allied to several tropical species, particularly to *G. angustata* (R. Br. Suppl. p. 24).

161. *Orites lancifolia** (Sect. *Acroderris*), F. Muell.; leaves oblong-lanceolate, flat, glabrous, blunt, net-veined, perfectly entire; spikes axillary and terminal, sub-solitary; calyx smooth; germen silky-downy; follicle silky.

HAB. On the rocky summits of the Australian Alps, 5000-6000 feet high; for instance, on Mount Wellington, Mount Hotham, Mount Latrobe, in the Munyang Mountains, in the upper valleys of the Mitta-Mitta, etc.

This fine shrub is, besides *Grevillea Victoriae*, the only really alpine species of this Natural Order, endemic, in the Australian continent. But I am uncertain whether it may prove to be identical with *O. Miligani*, of which no description has been hitherto given.

XLV. STACKHOUSIACEÆ.

162. *Tripterococcus spathulatus*,† F. Muell.; smooth, stems branched, ascendent; branches almost terete, streaked, foliate; leaves fleshy, oblong or obovate-spathulate; flowers nearly sessile; unguis of the petals longer than their lamina; style tripartite.

HAB. On the rocky and sandy shores of Wilson's Promontory, of Rivoli Bay, and Lake Alexandrina.

* This is probably a state of *Orites diversifolia*, Br.—ED.

† *Stackhousia maculata*, Sieb.—ED.

163. *Stackhousia pulvinaris*, F. Muell.; depressed, with numerous intricate rooting branches, perfectly smooth; leaves somewhat fleshy, oblong or spatulate-linear, nearly blunt; flowers solitary on the summit of very short branchlets; bracteoles twin, as long or longer than the pedicel; flowers yellow; three of the stamens longer than the two others; anthers glabrous; style deeply bi- or trifid.

HAB. On the highest summits of the Australian Alps, where, saturated with moisture, the widely expanded tufts, decorated with fragrant, starry flowers, form a beautiful carpet; 5000–7000 feet.

As a species it connects the Tasmanian *S. flava* with *S. minima*, from New Zealand.

XLVI. EUPHORBIACEÆ.

164. *Trachycaryon Klotzschii*, F. Muell.; leaves opposite, very short-stalked, ovate-lanceolate, acute, irregularly crenately toothed, serrate or repand, above smooth or imperfectly puberulous, beneath grey-velutinous, at the base of the petiole on both sides furnished with one or two small, stipitate glands; female flowers apetalous; sepals ovate, subacuminate; styles free, hardly bifid to the middle; capsules verruculose, ovate-globose, slightly impressed at the sutures; seeds grey, ovate, shining.

HAB. On sand-hills near Corner Inlet, and in various localities in South Australia.

165. *Trachycaryon Cunninghamii*, F. Muell.; leaves alternate, in circumference lanceolate-ovate or heartshaped, short or deep trifid, smooth or below tomentose, irregularly and coarsely serrate, at the base truncate or rounded, with acute lobes and teeth, on the base of the petiole furnished on both sides with one or two large stipitate glands; female flowers apetalous; sepals lanceolate, acuminate; styles free, deeply bifid; capsules subglobose, not furrowed at the sutures; seeds spotted.

Var. *α*, *tomentosum*; leaves short-stalked, below as well as the twigs and capsules tomentose; bracts and sepals ciliate.

Var. *β*, *glabrum*; leaves long-stalked, as well as the capsules, sepals, and bracts, smooth.

HAB. Between granite rocks and on the sandy banks of the Snowy River.

To var. *α* belongs probably *Adriana acerifolia* of Allan Cunningham, and to *β*, *A. heterophylla* of Sir William Hooker.

166. *Trachycaryon Hookerii*, F. Muell. ; leaves alternate, long-petiole, lanceolate-oblong, gradually narrowed into the base, acute or obtuse, smooth or grey-velutinous, irregularly crenate-toothed or bluntly lobed, at the base of the petiole on both sides beset with a small gland ; female flowers apetalous ; sepals ovate-lanceolate, acute ; styles at the base connate, deeply bifid ; capsule trigastrous, glabrescent.

Var. α , *velutinum* ; leaves above thinly, below, together with twigs and flowers, thicker velutinous.

Var. β , *glabriusculum* ; leaves on both sides smooth, twigs and flowers glabrescent.

HAB. On sand-ridges along the Murray, towards the junction of the Darling and the Murrumbidgee.

167. *Beyeria opaca*, F. Muell. ; smooth ; twigs compressed, yellowish-green ; leaves narrowly or linear-oblong, rounded-blunt, gradually narrowed into the base, hardly viscous or shining, with flat or slightly recurved margins, above light, beneath pale green ; pedicels of subequal length with the calyx ; capsules ovate-globose, hardly furrowed at the sutures ; seeds shining, variegated, with a thick caruncula.

HAB. In the Mallee Scrub, between Lake Lalbert, Lake Tyrrell, and the Murray River.

168. *Phyllanthus trachyspermus*, F. Muell. ; annual, smooth, glaucous ; stem upright, branched ; branches angular ; leaves imbricate, deciduous, oblong, obtuse, on very short petioles ; pedicels solitary, very short ; sepals lanceolate-acute, much shorter than the capsule, with broad, membranaceous margins ; stigmata very small ; capsula subglobose, smooth, drawn out into an umbonate apex ; seeds large, livid, acute, triangular, at the internal angle deeply excavate, on the sides and back rugosely asperate.

HAB. On places subject to inundations at the junction of the rivers Darling and Murray.

(To be continued.)

BOTANICAL INFORMATION.

ENSETÉ of Bruce.

In 1853 our valued correspondent, Walter Plowden, Esq., H. B. M. Consul at Massowah, Abyssinia, did us the favour to send us seeds,

and a few perfect fruits, under the name of "*Ansett*," of a species of Banana, much used as an article of food in Abyssinia; yet it is not, as in other countries, the fruit which is eaten, but the stem or trunk. The fruit indeed is small (compared with other Bananas or Plantains), rather pyriform than oblong, with a very uneven surface, varying in shape according to the number of seeds within, including little or almost no pulp, and terminated with the withered floral coverings. The seeds are nearly as large as small chestnuts, and so unlike what we had believed those of any *Musa* to be, that but for Mr. Plowden's authority we should not have believed them to be of that genus. However, as Banana-seeds we planted them, and Bananas they proved, very different certainly from *Musa paradisiaca* or *M. sapientum*, and clearly the *Ensete* of Bruce's Travels (see English ed. 8vo. vol. vii. p. 149, and Atlas, Tables 8 and 9). This *Ensete* is a plant totally unknown in botany or in books, save from what Bruce has written about it. No specimen or any further information seems ever to have come to Europe till now. Gmelin indeed has (Syst. Nat. p. 567) been pleased to call it *Musa Ensete*, and given a brief but most unsatisfactory character, entirely drawn from Bruce's figure; but Bruce himself stoutly maintained that "any one who would consider it a species of *Musa*, does so without any sort of reason." Yet the chief characteristics he gives to prove it is not a Banana or Plantain—for these were the only *Musas* known to Bruce—are marks common to both.

Though a *Musa*, without doubt however, Bruce, both in his figure and description, represents enough to prove that his *Ensete* is very different, specifically, from the common *Musas*; and our plants, now 4–6 feet high, further prove it to be so. We shall anxiously watch for the fructifying of our plants, and in the meantime we will give all that is worth extracting from Bruce's history, and then notice its affinity with some more recently discovered Indian species. The *Ensete** is considered to be "a native of Naree, and to grow in the great swamps and marshes in that country, formed by rivers rising there, which have little level to run to either ocean. It is said that the Galla, when they migrated into Abyssinia, brought for their particular use the Coffee-tree and the *Ensete*, the use of neither of which was before known. The

* Not *Enseté*, as printed in the 'Nouv. Dict. des Sciences Naturelles,' as is proved by Mr. Plowden writing the word *Ansett*, which would give a nearly similar pronunciation to *Ensete*.

general opinion indeed is that both are naturally produced in every part of Abyssinia, provided there is heat and moisture. It grows and comes to great perfection at Gondar, but it most abounds in that part of Maitsha and Goutto west of the Nile, where there are large plantations of it, and is there, almost to the exclusion of anything else, the food of the Galla inhabiting that province. Maitsha is nearly upon a dead level, and the rains have not slope to get off easily, but stagnate, and prevent the sowing of grain. Vegetable food would therefore be very scarce in Maitsha were it not for this plant."

We have already said that the fruit of the *Ensete* is not eatable; the one to three large seeds occupy almost the entire fruit, and by their size give the unequal form to the exterior of it. But the stem or trunk, as soon as it has attained its full size, before it becomes hard and fibrous, is eatable, and excellent, and when boiled it has the taste of the best new wheat-bread not perfectly baked. "When you make use of the *Ensete* for eating, you cut it immediately above the root, and perhaps a foot or two higher as the plant advances in age. You strip the green from the outer part till it becomes white; when soft, like a turnip well boiled, if eat with milk or butter, it is the best of all food, wholesome, nourishing, and easily digested."

"We see," says Bruce, "in some of the Egyptian antique statues the figure of Isis sitting between the branches (foliage?) of the Banana-tree, as it is supposed, and some handfuls of ears of wheat; you see likewise the hippopotamus ravaging a quantity of Banana-trees. But the (true) Banana is not a plant of the country, and could never have entered into the list of their hieroglyphics; for this reason it could not figure anything permanent or regular in the history of Egypt or its climate. I therefore imagine that this hieroglyphic was wholly Ethiopian, and that the supposed Banana, which, as an adventitious plant, signifies nothing in Egypt, was only a representation of the *Ensete*, and that the record in the hieroglyphic of Isis and the *Ensete*-tree was something that happened between harvest and the time the *Ensete*-tree came to be in use, which is in October. The hippopotamus is generally thought to represent the Nile, that has been so abundant as to be destructive. When therefore we see upon the obelisks the hippopotamus destroying the Banana, we may suppose it meant that the extraordinary inundation had gone so far as not only to destroy the wheat, but also to retard or hurt the growth of the *Ensete*, which was to supply its

place. I do likewise conjecture that the bundle of branches of a plant which Horus Apollo says the ancient Egyptians produced as the food on which they lived before the discovery of wheat, was not the *Papyrus*, as he imagines, but this plant, the *Ensete*, which retired to its native Ethiopia upon a substitute being found better adapted to the climate of Egypt."

So much for the classical history of the *Ensete*; to which we may add that Mr. Stackhouse,* in his 'Commentary on Theophrastus,' suspects that Bruce's *Ensete* may be the *Mnasion* of that author, eatable like *Papyrus* and of a sweet taste, which others consider to be the *Cyperus esculentus* (see Spreng. Hist. Rei Herb. i. p. 78).

As a species, we may observe that Bruce seems to have taken great pains with his figures, and that, as far as foliage is concerned, they accurately represent our plant; and we may observe that, independent of inflorescence, the *Ensete* has a near affinity with the *Musa superba*, Roxb. Corom. F. vol. iii. tab. 223, and Hook. Bot. Mag. tab. 3849, 3850, of the Southern Peninsula of India; but the arrangement of the flowers on the spadix and the bracteal scales, as well as the seeds, rather than the fruit, are considerably different. The seeds in our own specimens are much larger, and we do not find more than from one to three in each fruit (Bruce describes only one), whereas in *M. superba* there are numerous seeds, arranged in two rows in each of the three cells. Again, the inflorescence, as represented by Bruce, almost exactly resembles that of Roxburgh's *Musa glauca* (Pl. Corom. iii. tab. 300), a native of Pegu, but the stem and foliage are considerably different, and the latter of a remarkably glaucous hue, as indicated by the specific name; whereas our plant has bright yellow-green leaves, and the costa purple on the under side. The fruit also very much resembles that of our plant in size and general form, but the seeds are smaller and more numerous. Both these new Musas of Roxburgh are seed-bearing, and the fruit is scarcely pulpy, and not eatable, and they produce no suckers from the root, as is probably the case with the *Ensete*.

* Mr. Stackhouse's note on the *Mnasion* of Theophrastus is as follows:— "Nullus dubit quin pl. *Ægypti* a D. Bruce descripta et delineata sub nomine '*Ensete*' (vide App. p. 36) hic referenda sit. Demptra terminatione Græca *ov*, voces *Mnasi*, *Ansi*, haud absimiles, et usus plantæ ad victum humanum idem"! (Theophrastus de Historia Plantarum, curante Joh. Stackhouse, Oxonii, 1813, vol. i. p. 207.)—"To clench the proof," adds my friend Mr. Bennett, who sent me the extract from the British Museum, "he (Mr. Stackhouse) gives a reduced copy of Bruce's figure, and places it opposite to Theophrastus's account of *Mnasion* at p. 174."

Bruce mentions the fact of the stem of the *Ensete* being *perennial*; in that respect differing remarkably from the common Bananas, which die immediately after ripening their fruit. The plant from which Bruce's drawings were made, he assures us, was ten years old.

NOTICES OF BOOKS.

GÉOGRAPHIE BOTANIQUE RAISONNÉE, ou *Exposition des Faits principaux et des Lois concernant la Distribution Géographique des Plantes de l'époque actuelle*; par M. ALPH. DE CANDOLLE. 2 vols. 8vo. Paris.

(Continued from p. 191.)

The question whether islands have fewer or more species than equivalent areas on continents, has long occupied the attention of naturalists, Von Buch holding that they have fewer, Schouw that they have more. M. de Candolle finds, as was to have been anticipated, that the extent of insular Floras varies with their proximity to the great continents. When so close that they may be regarded as almost a part of a continent, as Tasmania is of Australia, or Ceylon of the peninsula of India, there is no marked difference between the numerical proportions of the insular and continental Floras; but in the case of islands far removed from continents, their Floras are generally very poor in species, except those in the northern regions.

Under conjectural estimates of the total number of flowering plants on the surface of the globe, M. de Candolle enters into an extremely careful and close analysis of all the materials within his reach, and arrives at the conclusion that the number may be about 250,000, using the term species in the sense intended by Linnæus; and 400,000 to 500,000, in the sense adopted by many modern botanists. The former number greatly exceeds our own estimate; this we regret that we are not prepared to lay before the reader, but hope, by means of a careful analysis of the Floras of some large, well-explored tropical areas (much larger than have hitherto been treated of), to offer some more definite data for the foundation of such an estimate than have hitherto been published. From the numerous tables M. de Candolle has given of the known and supposed number of species inhabiting certain countries, it is evident, as we have before indicated, that his

opinion of the richness of these countries enormously exceeds that which our materials warrant us in forming; and further, it is evident that his estimate is not framed in accordance with the Linnæan sense of the term species; for instance, amongst the 1500 plants which he assigns to Britain there are, besides a great number of non-indigenous species, a still larger percentage of species that Linnæus would have considered as varieties.*

On the proportion of Genera to Species in different countries.—The uncertainty of the value of generic characters, or rather our opinion that most genera are arbitrarily defined groups, renders it exceedingly difficult to arrive at any definite conclusion upon this subject. Upon the whole, M. de Candolle concludes that the proportion of species to genera is smaller in islands than on continents, and we have no doubt that he is correct. We should further expect that the proportion would rise in direct proportion to the area of the island, just as it does in proceeding from small areas of continents to larger ones.

Chapter 25. On the division of the surface of the globe into Natural Regions.—This Chapter is chiefly devoted to a long and very interesting discussion of the merits, or rather demerits, of some of the botanical divisions hitherto proposed, and to reflections upon the difficulties that have hitherto rendered the attempt to arrive at a good division, or one that shall be recognized by any two or more botanists, quite impossible. Some remarks upon the objects to be obtained, and the errors to be avoided, are also good; but M. de Candolle gives no new attempt of his own.

For our own part, we believe that the materials do exist for an approximate determination of a limited number of tolerably well defined botanical regions, and which may be characterized by the predominance in number of species of certain Natural Families, by the features these form in the landscape, and by the absence of others. The materials however want tabulation, and the real reason why no attempt has hitherto been successful is because no one has taken pains to ascertain a sufficient number of facts in distribution. It is the number of errors

* Nyman's careful Catalogue of European Plants, just published, contains 9700 flowering plants, including a very large proportion that are doubtful, besides others which are certainly not species in the Linnæan sense. Allowing that there are as many undiscovered species in Europe as there are spurious species in Nyman's Catalogue (an enormous allowance), it would follow, according to M. de Candolle's estimate, that the globe contains twenty-five times as many plants as there are in Europe—an extravagant assumption in the present state of our knowledge.

of omission, rather than the want of skill, that have frustrated endeavours. Many of these errors have been unavoidable, it is true; but, on the other hand, the foundations of the division must be sought in a far more laborious accumulation of facts than any one has hitherto ventured upon. The fact that there are very few areas of the globe at all rich in species, of the extent of ten square degrees, that have not yielded upwards of 2-3000 species of plants now deposited in European herbaria, warrants our belief that the materials do exist. The only countries of that or greater extent not yet explored at all, and from which collections can be brought which would alter any conclusions capable of being drawn from materials now in Europe, are West Brazil, New Guinea, West China, and Central Africa; and these countries are all of them surrounded by territories from which several thousand species have been collected, which renders it extremely improbable that their vegetation presents many novel features of more than generic interest.

Chapter 26. Sketch of the vegetation of different countries in regard to the probable Origin of their Species, Genera, and Families.

The first subject investigated in this chapter is the origin of the existing European plants. Under this head, the merits of Edward Forbes's Essay on the connection of the existing Fauna and Flora of the British Isles, with the Geological changes which have affected their area, especially during the northern drift, etc. (Mem. Geolog. Surv. vol. i.), is fully discussed and highly appreciated. Forbes's argument is indeed made the basis of a complete review of this hypothesis, which is illustrated by the observations of others, and of M. De Candolle himself, who accepts nearly all its conclusions, and applies its principles to other Floras. This is followed by arguments in favour of the same views, derived from other sources, and especially from the distribution of species, which M. de Candolle thinks may possibly have been created on the Continent since Great Britain was separated from the Continent, and Ireland from Great Britain. He assumes this to be the case with the *Compositæ* and some allied families, because he finds that the species of these sensibly diminish in Great Britain, and still more in Ireland.*

* We suspect that this diminution may be so easily accounted for by climatic causes that it affords no proof of Forbes's hypothesis, even did it not require the otherwise gratuitous assumption of the relative late creation of the Order in question. M. de Candolle indeed appreciates this objection, and endeavours to explain it away, but his reasoning is not satisfactory.

From the plants of Europe M. de Candolle passes to the consideration of those of other countries, endeavouring to fix the shadows which indicate their having had an early history. The absence of peculiar species in the Plains of India he rightly assigns to their recent elevation. The vegetation of the Himalaya, he says, is less varied than that of the Alps or Pyrenees, a statement we exceedingly doubt, as also that Madagascar has more species in common with India and Ceylon than with South-eastern Africa.*

In treating of the probable Origin of some of the Genera and Natural Orders of existing plants, M. de Candolle speculates upon the significance of such facts, as that the remains of species of *Juglans*, *Acer*, and *Magnolia*, found in the European Miocene beds, remind us of the United States Flora, and that the numerous *Proteaceæ*, *Laurineæ*, *Leguminosæ*, and Palms of the European Eocene age, recall the vegetation of Australia and the Sunda Islands.† In connection with these and other facts in distribution, demanding a calm survey of such intangible hypotheses as the relative antiquity of different Orders of plants, and of plants and islands, and even of oceans and continents, there is a great deal of excellent matter, interspersed with ingenious observations, for which we must refer to the work itself.

BOOK IV. General Conclusions.

This book (consisting of only two pages), as containing a summary of M. de Candolle's conclusions, we shall translate entire:—

“The plants now inhabiting the globe have survived many changes, geological, geographical, and, latterly, historical. The history of their distribution is hence intimately connected with that of the whole vegetable kingdom.

“To explain existing facts, it is fortunately unnecessary to adopt any conclusion upon the most obscure hypotheses of Cosmogony and

* M. de Candolle says, “qu'avec les parties orientales de la Colonie du Cap;” but we suppose he includes Natal in this definition, and the coasts of Africa opposite to Madagascar.

† It must be noticed here that the assumed evidence of a relation between the European Miocene and Antipodean vegetation is not satisfactory. In the first place, many systematic botanists hesitate to accept the evidence put forward as to the Proteaceous affinity of the fossils; and with regard to the *Lauraceæ*, of which supposed leaves only have been found, they abound in extratropical regions of the northern hemisphere, and many species are found even in Japan, whilst the *Leguminosæ* and Palms are not typical of any particular tropical Flora, and are frequent in several temperate ones.

Palæontology, or on the mode of creation of species, the number originally created, and their primitive distribution. Botanical Geography can indicate certain probabilities, certain theories, but the principal facts in distribution depend upon more recent and less obscure causes. It suffices to understand and to allow certain facts and theories, which appear probable, namely, that groups of organized beings, under different hereditary forms (Classes, Orders, Genera, Species, and Races), have appeared at different places and at different times, the more simple perhaps first, the more complicated afterwards; that each of these groups has had a primitive centre of creation of greater or less extent; that they have, during the period of their existence, been able to become more rare or common, to spread more or less widely, according to the nature of the plants composing them, the means of propagation and diffusion they are possessed of, the absence or presence of animals noxious to them, the form and extent of the area they inhabit, the nature of the successive climates of each country, and the means of transport that the relative positions of land and sea may afford; that many of these groups have become extinct, whilst others have increased, at least as far as can be judged from comparing existing epochs with preceding ones; and lastly, that the latest geological epoch, the Quaternary (that which preceded the existence of man in Europe, and which followed the latest elevation of the Alps), has lasted many thousand years, during which important geographical and physical changes have affected Europe and some neighbouring countries, whilst other regions of the globe have suffered no change, or have been exposed to a different series of changes.

“ Thus the principal facts of Geology and Palæontology, reduced to the most general and incontestable, suffice to explain the facts of Botanical Geography, or at least to indicate the nature of the explanation, which it requires the progress of many sciences to complete.

“ The most numerous, the most important, and often the most anomalous facts in the existing distribution of plants, are explained by the operation of causes anterior to those now in operation, or by the joint operation of these and of still more ancient causes, sometimes of such as are primitive (connected with the earliest condition of the plant). The geographical and physical operations of our own epoch play but a secondary part. I have shown that in starting from an original fact, which it is impossible to understand, of the creation of a

certain form, in a certain country, and at a certain time, we ought to be able, and sometimes are able, to explain the following facts, chiefly by causes that operated previous to our own epoch:—1, the very unequal areas occupied by Natural Orders, Genera, and Species; 2, the disconnection of the areas that some of the species inhabit; 3, the distribution of the species of a genus or family in the area occupied by the genus or family; 4, the differences between the vegetations of countries that have analogous climates and that are not far apart, and the resemblance between the vegetation of countries that are apart, but between which an interchange of plants is now impossible.

“The only phenomena explicable by existing circumstances are—1, the limitation of species, and consequently of genera and families, in every country where they now appear; 2, the distribution of the species of an individual in the country it inhabits; 3, the geographical origin and extension of cultivated species; 4, the naturalization of species and opposite phenomenon of their increasing rarity; 5, the disappearance of species contemporaneous with man.

“In all this we observe proofs of the greater influence of primitive causes, and of those anterior to our epoch; but the growing activity of man is daily effacing these, and it is no small advantage of our progressing civilization that it enables us to collect a multitude of facts of which our successors will have no visible and tangible proof.”

APPENDIX.

This is devoted to an enumeration of the researches necessary to advance the study of Botanical Geography, under the several heads of Physics and Meteorology, Geography, Geology, Physiology of Plants, Descriptive Botany, Botanical Travellers, Botany as applied to Forestry and Antiquarian research, and the Dead Languages.

(To be continued.)

The Transactions of the JAMAICA SOCIETY OF ARTS, from December, 1854, to December, 1855. Vol. 1. 4to. Kingston, Jamaica.

“The Jamaica Society of Arts took its origin under the government of Sir Charles Grey, and was progressing very favourably until political events occurred of such a nature as to engross all minds, and supersede, or render abortive, any effort in that direction. Circumstances

have again transpired to arouse this Society from its state of inactivity. Just as the Great Exhibition in London, 1851, under the patronage of Prince Albert, was the cause of awakening and infusing new life and vigour into some of the almost defunct Art-Societies of Britain, which had been in existence nearly a century before, so the forthcoming Paris Exhibition has been the means of calling into activity, and awakening from its slumbers, the Society of Arts in Jamaica.”—“If for the Great Exhibition in London of 1851, a box of arrow-root from Montserrat, a solitary fish-pot, made by a black labourer in St. Kitts,—a specimen of seaside grapes from Barbadoes,—a box of Indian meal or maize from British Guiana,—a few physic-nuts from Demerara,—Cashew and Prickly Pear from the Bahamas,—starch and Cocoa-nut oil from Trinidad,—ornamental woods, numbering 225 specimens, from Cuba,—and a small piece of fossil-wood, sent by Governor Higginson, from Antigua,—if these were gladly admitted to the Great Exhibition, and much curiosity excited concerning them, why should not Jamaica, which abounds in every one of these, and thousands more equally valuable and equally objects of curiosity and interest,—why should not Jamaica do justice to herself, and take the high place assigned her by Providence in the productive industry of the world?” Such were the honourable motives which induced Jamaica to rouse herself from a lethargy into which she was thrown by circumstances, which brought her to the brink of ruin; and, led on by their excellent Governor, Sir Henry Barkly, a committee of some of the most able and patriotic gentlemen of the island were formed, a collection of the useful products of the island was sent to the Great Paris Exhibition in 1856, such as was second to few in that wonderful “Exposition des Produits de l’Industrie de toutes les Nations,” and the Transactions of the Jamaica Society of Arts, now under consideration, were commenced, and has continued a regular monthly publication ever since.

The Editor of this Journal has been called upon to draw up a Report for Government upon the *Collection* above alluded to, as far as regarded vegetable, and especially native, products; and it is a no less agreeable task to notice some of the contents of the volume before us, abounding as it does in subjects connected with economic botany, some extracted from other works, but the majority of them original treatises, frequently indeed anonymous. Generally each number has two or more pages devoted to introductory matter, showing the importance, in a

commercial point of view, and as of the highest interest to the colony, that the inhabitants should, to the utmost, develop the resources of the island, and how they can best be turned to a useful and profitable account.

The first article contains some remarks upon "*Cassia Senna of Jamaica*," which seems to be identical with the well-known *Cassia obovata* of Aleppo. If introduced, as is probable, into the Island, it has nevertheless taken possession of the burning beach of Fort Augusta and the arid sands of the Port Royal Pallisadoes, and might assuredly be collected for medicinal purposes.

Application of (Sugar-) Cane Trask to the manufacture of Paper, with the process to be employed.—(Another of the *Grasstribes*, viz. the Bamboo, is most extensively employed for making paper, both coarse and fine, in China, and the process will be found given in the number of the 'Athenæum' for April 5, 1856.)

Notes on Manilla Hemp: chiefly extracts; and we trust, ere long, that valuable species of Banana, *Musa texilis*, may be introduced into our own tropical colonies.

On Mangrove Roots for Tanning; by Mr. C. Grant.

On certain Vegetable Oils; by the same gentleman.

On the Texas Millet (*Sorghum cernuum*?) ; by Mr. W. T. March.

Mr. Wilson's Fibres.—Here are valuable remarks on the useful fibres of Jamaica, by Mr. Wilson, of the Botanic Garden, Bath, St. Thomas-in-the-East, and a list of fifty-one plants yielding them, accompanied by their correct nomenclature, the *botanical* as well as the English or vernacular name, a matter of the highest consequence, more so than people are aware of. A correct *botanical* name can never mislead: but we know that under one vernacular name, *Aloe* for example, half-a-dozen different plants are intended; the one to which that name is more commonly given is no *Aloe* at all, and is here properly called *Agave Americana* (American *Aloe* or *Curatoe*). This is however a duty that can only be performed by a botanist, and in this particular instance (for the samples were exhibited at Paris) Mr. Wilson's services were appreciated and rewarded by a Medal.

A superior Artist's Oil; E. C. (the Hon. Edward Chitty, we believe, a valuable contributor), derived from the *Aleurites triloba*.

On Casuarina muricata (?), E. C.—The Club-wood of the South Sea Islands, cultivated in Jamaica, and recommended to be much more so

on account of the extreme hardness of the timber, and (what is not usual with hard woods) the very rapid growth of the tree. In a garden at Kingston, Jamaica, which was formerly Mr. Chitty's, a *Casuarina* was planted in July, 1848, and in 1854 had attained a height of scarcely less than fifty feet!

On the Oil of "Behn," from Moringa pterygosperma, E. C.; showing that this plant may be very profitably cultivated. The tree is a native of the East, where it is called Horseradish-tree. It is the best watch-maker's oil.

The several valuable *Memoirs on Plantain* fibre, and various ones on the different starches and meals; for example, of *Yams*, *Plantain*, *Sweet and Bitter Cassava*, etc. etc.

The Trumpet-tree (*Cecropia peltata*), recommended for textile manufacture, paper, pulp, and cordage; and no wonder, seeing it is one of the *Urticeæ*, which are celebrated for the amount and quality of fibre.

The fourth number is wholly devoted to an excellently-arranged Catalogue of the Collection of Articles first exhibited in Kingston Museum, Jamaica, and afterwards sent to the Paris Universal Exhibition. The introductory remarks in this portion of the work give an excellent epitome of the natural history of the Island. And No. 6 and some following ones, to the able Report from the Museum Committees, and various Minutes of Proceedings respecting the formation of a permanent Museum in Jamaica.

On Tamarinds; the uses and advantages of cultivating the tree.

On Panama Hats, E. C.—The plant affording the material of which these celebrated hats are made (*Carludovica palmata*, according to Mr. Purdie) has been successfully introduced by Mr. Wilson.

On the Cashew and its uses; Bread from Yam Flour; Amadou, or Tinder, from the male catkins of the Bread-fruit, *Artocarpus incisa*.—This latter curious substance was exhibited at Paris.

On the Black Pepper (*Piper nigrum*).—Mode of preparing the Pepper from another and native species, *Piper Amalago*, is also given.

On the Exchange of Exotic Plants; recommended for mutual advantage.

On the Divi-Divi (*Cæsalpinia coriaria*); a valuable tanning substance.

On the Commercial Quassia or Bitter-wood: an interesting memoir, clearing up the differences between *Quassia amara*, or Surinam Bitter-

wood; *Simaruba officinalis*, the Simarouba, or official Bitter-wood; and the *Simaruba excelsa*, or lofty Bitter-wood.

On the Podocarpus or Yacca (*Podocarpus Purdiei*).—A tree of this has been detected in the neighbourhood of Dunrobin Castle (elevation 3000 feet above the sea), 100 feet in height, and 42 inches in diameter at 6 feet from the ground. The wood has been proved to be of indifferent quality by Captain Fowke.

A Paper on the "*Causes of the Evils which tend to the prostration of Jamaica*," will be read by all with interest, and by many, it is to be hoped, with profit.

On Bitter Cassava; its more extended cultivation strongly urged.

On Corn-husk Bonnets.—Bonnets made of the corn-husks or corn-trash (the sheathing covering of the great ears) were exhibited at the Paris Exhibition, and are said to be as durable as straw.

On the Aloe of Commerce, a true Aloe (*Aloe Barbadosensis*, introduced to Barbadoes from the Cape).

On Tartaric Acid from Tamarinds.

On Holcus saccharatus, lately so strongly recommended for sugar by a gentleman of Natal, in preference to the sugar-cane; but we are here correctly informed that the "sugar-cane need not fear her northern rival."

Hoops and Ox-bows made from the Rose Apple-tree (*Eugenia Jambos*, Linn.).

Fibre of the Jerusalem Dagger-plant (*Yucca aloifolia*).—This seemed to promise well, but the quantity sent (as was unfortunately the case with the fibres generally that were sent by Jamaica to the Paris Exhibition) was too small for satisfactory experiment.

Paper from Plantain Fibre and from Wood.

The last notice of the year, relating to vegetable products, is not the least interesting, the application of the *Castor-oil plant* (*Ricinus communis*), for feeding a new kind of silkworm* from Assam. The subject, in another collection, attracted much interest among the naturalists of Paris; and a silver medal was awarded to the exhibitor on that occasion.

With great pleasure we have received the commencement of the second volume, and shall be glad to notice it at some future period.

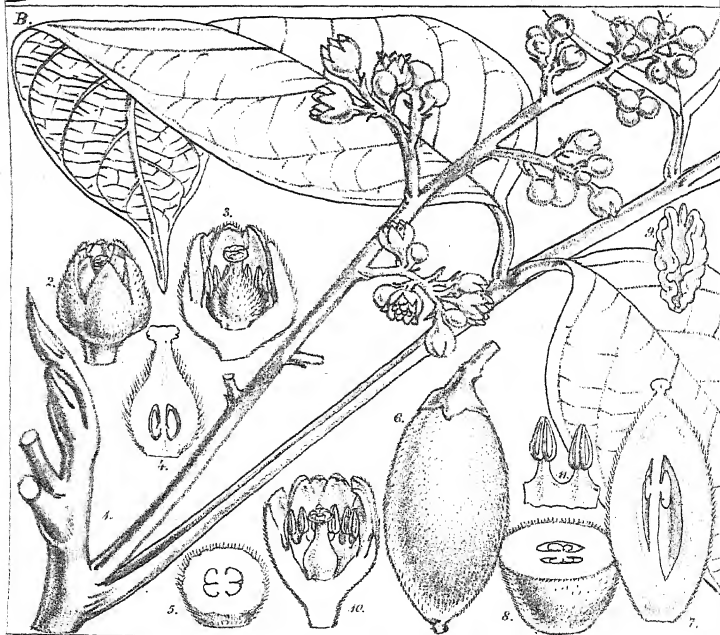
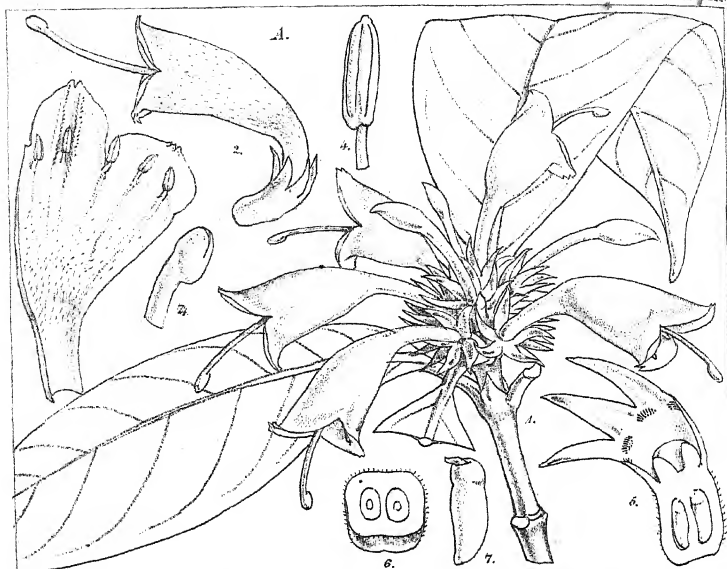
* Caterpillar of the *Bombyx Cynthia*.

SCHOTT, HENRY; *Synopsis AROIDEARUM, complectens Enumerationem Systematicam Generum et Specierum hujus Ordinis*. Vol. I. 8vo. Vindobonæ, 1856; 153 pages.

The name of Schott has long been familiar to the student of Aroidous plants, and the collection of living *Aroideæ* at Vienna, under his charge, has a wide reputation. In our Journal for 1855, p. 224, July number, we noticed, with great commendation, the two Fascicles in folio of the great work on *Aroideæ*, alike admirable in matter and illustration. We do not learn that any more of that work has been yet issued, and probably the slowness of the progress of it, owing to the careful execution of the plates, has induced the author to lay before the botanical world a synopsis or a systematic enumeration of all known genera and species of the Family, giving characters or remarks on the genera, and observations on, or characters of, the species.

In this useful little work the *Aroideæ* are divided into two great groups—1, DICLINES, and 2, MONOCLINES; the first Part now before us embraces all of the first group, and include—1, *Cryptocoryne*; 2, *Lagenandra*; 3, *Ambrosinia*; 4, *Arisarum*; 5, *Pinellia*; 6, *Biarum*; 7, *Ischarum*; 8, *Gymnomesium*; 9, *Arum*; 10, *Eminium*; 11, *Typhonium*; 12, *Theriophonum*; 13, *Helicodiceros*; 14, *Helicophyllum*; 15, *Drancunculus*; 16, *Dochafa*; 17, *Sauromatum*; 18, *Arisæma*; 19, *Zomicarpa*; 20, *Plesmonium*; 21, *Conophallus*; 22, *Brachyspatha*; 23, *Pythonium*; 24, *Amorphophallus*; 25, *Ariopsis*; 26, *Colocasias*; 27, *Remusatia*; 28, *Gonatanthus*; 29, *Alocasia*; 30, *Peltandra*; 31, *Cajadium*; 32, *Xanthosoma*; 33, *Acontias*; 34, *Syngonium*; 35, *Anchomanes*; 36, *Zamioculcas*; 37, *Montrichardia*; 38, *Philodendron*; 39, *Culcacia*; 40, *Zantedeschia*; 41, *Homalomena*; 42, *Cyrtocladon*; 43, *Schismatoglottis*; 44, *Aglaonema*; 45, *Spathicarpa*; 46, *Asterostigma*; 47, *Dieffenbachia*; 48, *Richardia*; 49, *Stylochiton*.

We shall welcome the appearance of the second, and, we presume, concluding part of this Synopsis; and no less so the continuation of the illustrated "AROIDEÆ" of this author.



*On the BAMBOO and DURIAN of BORNEO; by A. R. WALLACE, Esq.,
F.L.S. (In a Letter to Sir W. J. Hooker.)*

Two vegetable productions particularly attracted my attention in Borneo,—the Bamboo, most useful of plants, and the Durian, king of fruits.

Different species of Bamboo abound in all tropical countries, and wherever they are found the natives apply them to a great variety of uses. Their strength, lightness, smoothness, straightness, roundness, and hollowness,—the facility and regularity with which they can be split,—their different sizes, the varied distance of their joints, the ease with which they can be cut, and with which holes can be made in them,—their hardness outside, their freedom from any taste or smell, their great abundance, and the facility with which they are propagated,—all make them fitted for a hundred different purposes, to serve which other materials would require much labour and preparation. They are at once the most wonderful and the most beautiful production of the tropics, and the best gift of Nature to uncivilized man.

I shall briefly mention the uses to which they are applied by the native tribes of Borneo, which have fallen under my notice, and which have struck me the more forcibly, because in the parts of South America I have visited, Bamboos are comparatively scarce, and where found, but little used, their place being taken, as to one class of uses, by the great variety of Palms, and as to another, by Calabashes and Gourds.

The Dyak houses are all raised on posts, and are often two or three hundred feet long, and forty or fifty wide. The floor is always formed of large bamboos, which are split into four or five strips, so that each may be nearly flat, and these are firmly tied down with rattan to the rafters beneath. This, when well made, is a delightful floor to walk upon barefooted, the rounded surfaces of the bamboo being very smooth and agreeable to the feet, while at the same time affording a firm hold. But what is more important, they form, with a mat over them, an excellent bed,—the elasticity of the bamboo, and the undulating nature of the surface, being far superior to a more rigid or flatter floor. Here at once we have a use which cannot be supplied so well by another material without a vast amount of labour, all Palm stems and other substitutes requiring much cutting and smoothing, and not being equal

to bamboo when finished. Some tribes however prefer a flat and close floor, and they make bamboo-boards for the purpose, by splitting open a large bamboo on one side only, and flattening it out, so as to form beautiful slabs, eighteen inches wide and six feet long, with which they floor their houses. These, with constant rubbing and daily smoke, become dark and polished, so that their material can at first sight be hardly recognized. What labour is here saved, to a savage with only his axe, who, if he wanted boards, must hew them out of the solid tree, and, with all his labour, could never produce a surface so smooth and beautiful as the bamboo, thus treated, affords him. Again, if a temporary house or shed is wanted, either by the traveller in the jungle or by the native in his paddy-fields, nothing is so convenient as the bamboo, with which a house can be constructed with half the labour and in half the time, than if any other material is used.

The hill Dyaks in the interior of Sarawak make paths for great distances, to their cultivated grounds, in the course of which they have to cross rivers and numerous gullies and ravines, or sometimes to avoid a long circuit, to carry the path along the face of a precipice. In all these cases the bridges they construct are of bamboo, and so admirably adapted is the material to the purpose, that it seems doubtful whether they would ever have made them had they not possessed it. The Dyak bridge is simple but well designed. It consists merely of bamboo poles, crossing each other at the roadway like the letter X, and rising, sometimes on one side, sometimes on both, three or four feet above it. At the crossing they are firmly bound together, and to a horizontal bamboo, which forms the only footpath, with another higher up, serving as a hand-rail. When a river is to be crossed, an overhanging tree is chosen, from which the bridge is partly suspended, and partly supported by diagonal struts from the banks, so as to avoid placing posts in the stream itself, when liable to floods. In carrying a path along the face of a precipice, trees and roots are made use of for suspension, from every little notch and crevice struts arise, while immense bamboos, of fifty or sixty feet long, are fixed on some bank or tree below. These bridges are traversed daily by men and women carrying heavy loads, so that any insecurity is soon discovered, and, as the materials are close at hand, immediately repaired. When the path goes over very steep and slippery ground, the bamboo is used to form steps. Pieces are cut, about a yard long, and opposite notches

being made at each end, holes are formed, through which pegs are driven, and a ladder or staircase is produced with the greatest celerity. It is true that much of this will decay in one or two seasons, but it is so quickly replaced, as to make it more economical than using a more durable wood.

One of the most striking uses to which Bamboo is applied by the Dyaks, is in climbing the loftiest forest-trees, either to gather fruit or to obtain wax. The honey-bee of Borneo very generally makes its nest on the branches of the "Tappang," a tree which towers above all others in the forest, and whose smooth cylindrical trunk rises a hundred feet or more without a branch. Bees'-wax is one of the most valuable products of the forest, and the Dyaks climb these lofty trees at night to obtain it, by means of bamboo pegs driven into the wood. These pegs are formed of thick, old bamboo, split to about two inches wide. Each is cut above a joint, which forms a solid head to bear the blows of the mallet, and the point is flat and broad, cut away carefully to the siliceous outer coating. To the head of each is strongly tied a strip of the tough rind of a water-plant. The climber carries forty or fifty of these pegs in a basket by his side, and has a wooden mallet suspended round his neck; he has also prepared a number of strong, but slender bamboos, each from twenty to thirty feet long. One of these he sticks firmly in the ground at the foot of the tree, and close to it; he then drives in a peg as high as he can reach, and ties it firmly by the head to the bamboo; climbing up upon this, he drives in and ties two other pegs, each about three feet from the one below it, passing his arm between the tree and the bamboo, to hold the peg which he is driving in. He soon reaches the top of his pole, when another one is handed up to him, and being bound to the one below, he ascends in the same way another twenty feet. When his pegs are exhausted, a boy brings a fresh basketful up to him, and a long cord enables him to pull up the bamboos as he requires them. This mode of ascent looks perilous, but is in reality perfectly secure. Each peg holds as tightly as a spike-nail, besides which the weight is always distributed over a great number of them by means of the vertical bamboos. Trees which branch at forty feet or less, are often ascended by pegs alone, which, besides being dangerous, requires much skill and activity in the climber, as he must grasp the middle peg firmly with his hand to hold himself up, and has but one hand at liberty to drive in the pegs. I have seen trees as-

cended by both methods, and admired the excellent qualities of bamboo, as well as the ingenuity of the Dyaks in taking advantage of them.

Split and shaved thin, bamboo is the strongest material for baskets; conical fish-traps, hencoops, and birdcages are made by splitting a piece up to the joint which forms the top, gradually-increasing circles of rattan being inserted below; rough fruit-baskets are also rapidly made in this manner. Aqueducts are formed by large bamboos split in half, supported on crossed poles of various heights. They are the Dyaks' only water-vessels, and are in fact superior to earthen vessels, being clean, light, and easily carried. A dozen water-bamboos stand in the corner of every Dyak house. They also make excellent cooking utensils; vegetables and rice are often boiled in them. They are used to preserve sugar, vinegar, honey, salted fruit or fish,—in fact, they answer every purpose for which jars and bottles are used by us. In a small bamboo case, prettily carved and ornamented, the Dyak carries his *siri* and lime for betel-chewing, and his little long-bladed knife has a bamboo sheath. His favourite pipe is a huge hubble-bubble, which he will construct in a few minutes by inserting a small piece of bamboo for a bowl, at an acute angle, into a large cylinder, about six inches from the bottom, which contains water through which the smoke passes. In many other small matters the bamboo is of daily use, but enough has been here mentioned to show its value, as a substitute in many cases for iron, and in enabling the natives to dispense with a variety of tools and utensils.

The second object of my especial admiration is the Durian, a fruit of which we hear little in England, where all praise is given to the Mangosteen, while the Durian is generally mentioned as a fruit much liked by natives, but whose offensive smell renders it disagreeable to Europeans. There is however no comparison between them; the Mangosteen resembles a peach or a grape, and can hardly be said to be superior, if equal, to either: the Durian, on the other hand, is a fruit of a perfectly unique character; we have nothing with which it can be compared, and it is therefore the more difficult to judge whether it is or is not superior to all other fruits.

The Durian grows on a large and lofty forest-tree, something resembling an Elm in character, but with a more smooth and scaly bark. The fruit is round or slightly oval, about the size of a small melon, of a green colour, and covered with strong spines, the bases of which

touch each other, and are consequently somewhat hexagonal, while the points are very strong and sharp. It is so completely armed that if the stalk is broken off it is a difficult matter to lift one from the ground. The outer rind is so thick and tough that from whatever height it may fall it is never broken. From the base to the apex five very faint lines may be traced, over which the spines somewhat curve and approximate; these are the sutures of the carpels, and show where the fruit may be opened with a heavy knife and a strong hand. The five cells are silky-white within, and are filled with a mass of firm, cream-coloured pulp, containing about three seeds each. This pulp is the eatable part, and its consistence and flavour are indescribable. A rich custard highly flavoured with almonds gives the best general idea of it, but there are occasional wafts of flavour that call to mind cream-cheese, onion-sauce, sherry-wine, and other incongruous dishes. Then there is a rich glutinous smoothness in the pulp which nothing else possesses, but which adds to its delicacy. It is neither acid nor sweet nor juicy; yet it wants neither of these qualities, for it is in itself perfect. It produces no nausea or other bad effect, and the more you eat of it the less you feel inclined to stop. In fact, to eat Durians is a new sensation worth a voyage to the East to experience.

The smell of the ripe fruit is certainly at first disagreeable, though less so when it has newly fallen from the tree; for the moment it is ripe it falls of itself, and the only way to eat Durians in perfection is to get them as they fall. It would perhaps not be correct to say that the Durian is the best of all fruits, because it cannot supply the place of subacid juicy fruits such as the orange, grape, mango, and mangosteen, whose refreshing and cooling qualities are so grateful; but as producing a food of the most exquisite flavour it is unsurpassed. If I had to fix on two only as representing the perfection of the two classes, I should certainly choose the Durian and the Orange as the king and queen of fruits.

The Durian is however (in another way) dangerous. As a tree ripens the fruit falls daily and almost hourly, and accidents not unfrequently happen to persons walking or working under them. When a Durian strikes a man in its fall it produces a fearful wound, the strong spines tearing open the flesh, while the blow itself is very heavy; but from this very circumstance death rarely ensues, the copious effusion of blood preventing the inflammation which might otherwise take place.

A Dyak chief informed me that he had been struck down by a Durian falling on his head, which he thought would certainly have caused his death, yet he recovered in a very short time.

Poets and moralists, judging from our English trees and fruits, have thought that there existed an inverse proportion between the size of the one and the other, so that their fall should be harmless to man. Two of the most formidable fruits known, however, the Brazil Nut (*Bertholletia*) and the Durian, grow on lofty trees, from which they both fall as soon as they are ripe, and often wound or kill those who seek to obtain them. From this we may learn two things:—first, not to draw conclusions from a very partial view of Nature; and secondly, that trees and fruits and all the varied productions of the animal and vegetable kingdoms, have not been created solely for the use and convenience of man.

The unripe Durian makes a very good vegetable, and it is also eaten raw. In a good fruit season the Dyaks preserve quantities of the pulp salted in jars and bamboos, in which state it will keep the year round, and is much esteemed as a relish with their rice. They seem hardly to appreciate the ripe fruit in its perfection, from the quantities they gather unripe, and from the small value they place upon it, as compared with the Jack and some other fruits. In Borneo great numbers of Durian trees have been planted on the mountains occupied by the Dyaks, and on the rivers' banks in the interior. In the jungle are found two varieties with much smaller fruits, one of them of an orange-colour inside; and these are probably the originals of the large and fine Durians which seem never to be produced in a wild state. In the tropics as well as in our colder climates, fruits always seem to be improved by cultivation.

On some Undescribed Species of MUSCI belonging to the Genera MNIMUM and BRYUM; by W. MITTEN, Esq.

(Plate XI. *A, B.*)

1. *Mnium insigne*, Mitten; dioicum, caulibus sterilibus procumbentibus, fertilibus erectis subsimplicibus elatis, foliis oblongis nervo excurrente cuspidatis marginatis serratis basi parum angustatis longe lateque decurrentibus, perichæcialibus exterioribus longioribus interioribus brevibus subulatis angustis, theca longe pedunculata ovali pendula, operculo conico obtuso, peristomio normali.

HAB. Sweden, *Sommerfelt*. Britain: Sussex, *Mitten*; Cheshire, *Wilson*. "The Vosges," *Mougeot and Schimper*. North America, *Menzies, Douglas, Drummond, Burke*.

This fine species differs from *M. affine*, Bland., in its longer and narrower leaves, which are widely decurrent at their bases; in *M. affine* the leaves are narrowed to a base not wider than the stem, and not at all decurrent. In its general appearance this Moss is intermediate between *M. affine* and *M. undulatum*; to the last it approaches very nearly when dry. The stems most frequently bear several capsules, which resemble those of *M. affine*.

The Fig. 2 of Tab. X. of *M. affine*, β *elatum*, 'Bryologia Europæa,' *Mnium*, is evidently taken from a portion of the stem of *M. insigne*.

2. *Mnium venustum*, sp. nov.; synoicum, caulibus fertilibus sterilibusque erectis rigidis densifoliosis, foliis erecto-patentibus ellipticis acuminatis nervo excurrente cuspidatis marginatis argute dentatis, perichætalibus cuspidatis interioribus angustis lanceolatis, theca in pedunculo longiusculo inclinata pendulave oblonga, basi poris pluribus cellulis intensius coloratis circumductis quasi apophysata, operculo conico acuminato acuto. (Tab. XI. A.)

HAB. West coast of North America, *Menzies* and *Douglas*.

In size, colour, and general appearance, very nearly resembling *Mnium cuspidatum*, but the leaves are more acuminate and more rigid, the capsule longer, with a band of coloured stomata at its base, resembling an apophysis. The sterile stems appear to have the habit of those of *M. hornum*.—Plate XI. A. fig. 1, plant, *nat. size*; 2, perichætal leaves; 3, cauline ditto; 4, capsule; 5, areolation of leaf; 6, ditto of *M. affine*, to show their relative size:—*all highly magnified*.

3. *Mnium trichomanes*, sp. nov.; dioicum, caulibus sterilibus procumbentibus, fertilibus erectis, foliis ellipticis ovatisve marginatis e medio ad apicem serratis nervo excurrente mucronatis basi decurrentibus, perichætalibus longioribus lanceolatis, theca ovali pendula, operculo convexo conico. (Tab. XI. B.)

HAB. Moist, shaded bank in a glen, Pih-quan Island, China, *Alexander*; North-west India, without fruit, *Dr. Thomson*.

Size, habit, and colour of *M. cuspidatum*, but distinct in the inflorescence; remote from *M. affine*, including the var. *Rugicum*, in the decurrent leaves, and dense substance of its leaves composed of cells three times smaller. The capsules are too immature to afford any idea

of the peristome.—Plate XI. *B.* fig. 1, plant, *nat. size*; 2, perichætal leaves; 3, cauline ditto; 4, capsule:—*all magnified*.

4. *Bryum rubens*, sp. nov.; dioicum, caule breviusculo, foliis ellipticis ovatisve nervo excurrente mucronatis tenui-marginatis apicem versus serratis e cellulis satis magnis elongatis limitibus angustis firmis areolatis, perichætalibus angustioribus, theca clavato-oblonga, operculo magno brevi conico acuto, peristomio normali.

HAB. Throughout the temperate parts of Europe, Asia, and North-west America.

Very variable in size, but easily distinguished from *B. sanguineum*, Brid. (*B. erythrocarpum*, Schw.), by its leaves being twice as wide as the margin, distinctly not recurved, the serratures larger, the areolation composed of cells of about the same length, but double the width. The capsules are not quite so slender, but in other respects nearly resemble those of *B. sanguineum*. When old, the whole plant becomes of a deep red colour.

This species has been confused with its near ally *B. sanguineum*, and with some others. The following is a summary of the specimens examined:—

B. erythrocarpum, β *sylvaticum*, Hampe, Exsic. No. 201.—In sylvis Blankenburgicis.

B. erythrocarpum, Istria, *Mueller*.

B. longisetum, from near Hamburg.

B. turbinatum, Dickson, in Herb. Hooker.

B. Morisii, Bruch, MSS. Sardinia, *Mueller*.

It is possible that *B. rubens* is *B. radiculosum*, Brid., but in the 'Bryologia Europæa,' where a good figure of *B. sanguineum* = *B. erythrocarpum* is given, *B. radiculosum* is enumerated as a slight variety, and not figured. Bridel, too, compares his Moss to *B. carneum*, from which it may be assumed that it must be something different; the geniculate seta can scarcely be supposed to be a character worth notice.

B. sanguineum, Brid., is in habit and appearance a miniature resemblance to *B. alpinum*, but *B. rubens* in the same respects approaches more to *B. cæspiticium*, without however being so nearly allied to it as to *B. sanguineum*.

B. Morisii, Bruch, MSS., is in De Notaris' 'Syllabus' enumerated as *B. tomentosum*, Brid., but now considered by the author to be a

state of *B. torquescens*. With regard to this MS. name of Bruch's, 'Bryologia Europæa' is silent.

5. *Bryum Gardneri*, sp. nov.; synoicum, caule humili, foliis patentibus lanceolatis planiusculis nervo excurrente mucronatis margine reflexis apice serrulatis, perichæatialibus conformibus, theca ovali-pyriformi, operculo magno conico apiculato, peristomio *B. sanguinei*.

HAB. Organ Mountains, Brazil, on a clay bank, *Gardner*, No. 37.

Closely resembling *B. sanguineum* in size and general appearance, but in proportion its leaves are longer and the margin reflexed.

DECADES OF FUNGI; by the REV. M. J. BERKELEY, M.A., F.L.S.

Decades LIX.-LX.

(With Plates V., VI., IX., X.)

Rio Negro Fungi.

(Continued from p. 200.)

581. *P. (Inodermei) chrysites*, n. s.; pileo tenui coriaceo flexili tomento denso rhabarbarino vestito sulcato-zonato; hymenio concolori; poris minutis angulatis; dissepimentis tenuibus.

HAB. On dead trunks in woods. San Carlos. August, 1853.

Pileus $2\frac{1}{2}$ inches across, dimidiate, convex, thin, flexible, coriaceous, clothed with dense rhubarb-yellow, spongy down, zonato-sulcate. Hymenium concave, of the same colour as the pileus; pores minute, $\frac{1}{200}$ of an inch across, angular; dissepiments thin; substance yellow, like the pileus.

A beautiful species, resembling in colour *P. Splitgerberi*, Mont. The whole substance of the pileus resembles the external coat, with the exception of a very thin, hard, dark plate or two, a little beyond the hymenium.

582. *P. (Inodermei) cupreo-roseus*; pileo tenui subconvexo coriaceo cupreo sericeo-nitente radiato-rugoso lineatoque crebrizonato; margine acuto; hymenio vinoso; poris mediis flexuosis. Spruce, n. 184.

HAB. On dead trunks. Panurá, February, 1853. San Carlos, August, 1853.

Pileus 9 inches or more across, $4\frac{1}{2}$ long, thin, somewhat convex,

coriaceous, at first velvety behind, radiato-rugose and marked with raised lines, repeatedly zoned, pink, tinged with fawn, and at length copper-coloured, shining with a silky lustre, especially with age; margin acute, lobed or nearly entire; substance pink. Hymenium flat or convex, rose-coloured, at length vinous; pores middle-sized, $\frac{1}{10}$ of an inch across, flexuous.

A most splendid species, varying in shade with age, but always displaying beautiful red tints; in one variety obscured both above and below with umber. The colour of the hymenium in the younger specimens is just that of raspberries and cream.

* *P. Floridanus*, B., Ann. of Nat. Hist. vol. x. p. 376.

HAB. On trunks of trees in woods. San Carlos.

There are two forms,—one thinner, broader, more flexible, and with paler, more concentrically arranged pores.

583. *P. (Inodermei) albo-cervinus*, n. s.; pileo tenui coriaceo flabelliformi reniformique cervino subtiliter tomentoso zonato rugosiusculo; hymenio albo; poris minutis punctiformibus. Spruce, n. 22.

HAB. On dead trunks. Panuré, and at the foot of Mount Cocui.

Pileus 2 inches across, thin, coriaceous, very variable in form, sometimes spuriously stipitate and cuneiform, sometimes flabelliform, sometimes reniform or effused and reflexed, fawn-coloured, zoned, even or radiato-rugose. Hymenium white or slightly tinged with umber; pores minute, $\frac{1}{150}$ of an inch across, punctiform.

This pretty but very variable species has many points in common with *P. Didrichsenii*, but differs evidently in the far smaller pores.

* *P. (Inodermei) hirsutus*, Fr. Ep. p. 477. Spruce, n. 28, 60.

HAB. On decaying trunks. Panuré.

* *P. (Inodermei) velutinus*, Fr. Ep. p. 478.

HAB. On dead branches in woods. San Carlos. August, 1853.

A very thin, pale, tomentose variety, resembling in colour and habit *P. hirsutus*.

584. *P. (Inodermei) hædinus*, n. s.; albus, suborbicularis, postice decurrens, tenuis, papyraceus; pileo subtiliter pubescente sulcato-zonato; hymenio concolori; poris angulatis minutis; dissepimentis tenuibus. Spruce, n. 38, 203.

HAB. On decaying trunks. Panuré.

Pileus 1–2½ inches across, suborbicular, decurrent behind, very thin and flexible, clothed with depressed matted down, sulcato-zonate; edge

nearly entire. Hymenium of the same colour as the pileus; pores minute, $\frac{1}{100}$ of an inch across, angular; dissepiments very thin.

An elegant species, allied to *P. hirsutus*, but much thinner, with finer pores, and destitute of distinct hairs.

585. *P. (Resupinatus) deglubens*, n. s.; albus, resupinatus; margine ubique liberato inflexo elevato-zonato nitido; poris minutis punctiformibus.

HAB. On dead sticks. San Carlos.

White. Patches elliptic, $\frac{3}{4}$ of an inch long; margin free all round, inflexed, shining with a silky lustre, marked with one or two acute zones or ridges; pores scarcely visible to the naked eye, punctiform.

586. *P. (Resupinatus) cavernulosus*, n. s.; totus resupinatus, rigidusculus, sordide cervinus; margine brevi tomentoso; poris mediis angulatis, acie rigidis. Spruce, n. 204.

HAB. On dead branches. Panuré.

Resupinate, orbicular, at length confluent, of a dirty fawn colour, darker in the centre, rigid; margin narrow, formed of matted down, but not byssoid; pores $\frac{1}{45}$ of an inch across, subhexagonal; edge rigid, sometimes elongated at the commissures, sometimes slightly waved.

587. *P. (Resupinatus) carneo-pallens*, n. s.; totus resupinatus, tenuis, carneus; margine obsoleto; poris minutis; dissepimentis tenuissimis angulatis. Spruce, n. 178.

HAB. On dead trunks. Panuré. February, 1853.

Entirely resupinate, thin, flesh-coloured, without any distinct margin, or where there is anything beyond the hymenium, consisting of a little matted down; pores $\frac{1}{150}$ of an inch across, angular; dissepiments very thin; edge nearly entire, paler, often broken up and expanded.

588. *P. (Resupinatus) evolvens*, n. s.; resupinatus, demum liberatus, centro affixus; pileo sursum cupreo-incarnato sericeo-nitente; hymenio gilvo; poris parvis, acie dentato-elongatis. Spruce, n. 214.

HAB. On dead wood. San Carlos del Rio Negro. May, 1853.

Orbicular, confluent, resupinate, at length free and attached in the centre, of a coppery, flesh colour above, silky, slightly zoned; edge thin, sometimes torn. Hymenium darker; pores small, $\frac{1}{60}$ of an inch across, angular; dissepiments thin; edge dentato-elongated, especially at the commissures.

* *Trametes fibrosa*, Fr. El. p. 490. Spruce, n. 201.

HAB. On dead trunks. Panuré.

* *T. Hydnoides*, Fr. El. p. 490.

HAB. In woods. San Carlos. August, 1853.

* *T. occidentalis*, Fr. El. p. 491. Spruce, n. 29, 185.

HAB. On dead wood in the neighbourhood of cottages. Very common. Rivers Uaupés and Negro. February, 1853.

589. *T. sclerodepsis*, n. s.; pileo subtenui rigido suberoso dimidiato plano albido-cinereo; margine acuto, zonis crebris cervinis picto, radiato striato rugosuloque; hymenio pallide umbrino convexiusculo; poris punctiformibus. Spruce, n. 167.

HAB. On dead trunks. Panuré.

Pileus 8 inches or more across, 6 long, dimidiate, flat, rather thin, hard and corky, dirty-white or ash-coloured, marked with numerous zones, those towards the margin broader and fawn-coloured, pruinose, but not decidedly tomentose; substance whitish. Hymenium rather convex, pale umber; pores punctiform, $\frac{1}{6}$ of an inch across.

Something in the style of *T. occidentalis*, but far larger, more woody, and free from any woolly coat.

590. *T. Sprucei*, n. s.; pileo crassiusculo gibboso obtuso dealbato; contextu duro; poris subrotundis subflexuosis; dissepimentis obtusis. Spruce, n. 166.

HAB. On trunks of trees. March, 1853. Panuré.

Pileus $1\frac{1}{2}$ –2 inches across, $\frac{1}{2}$ an inch long, decurrent behind, gibbous, obtuse, even or nearly so, opaque, white, as if whitewashed; substance hard, white; pores about $\frac{1}{8}$ of an inch broad, roundish, but slightly flexuous; dissepiments rigid; edge obtuse.

The habit of this species is peculiar. There is not the slightest tendency to form gills.

591. *Dædalea Sprucei*, n. s.; pileo suberoso subconvexo scabriusculo; margine zonato; hymenio convexo; poris flexuosis; dissepimentis in lamellas ruptis. Spruce, n. 41.

HAB. On dead trunks. Panuré.

Pileus 5 inches or more across, dirty-umber, corky, thin, slightly rough, zoned towards the margin; dissepiments of the elongated, flexuose pores brown-umber, soon broken up into lamelliform processes.

At a very early stage of growth, when the pileus is only an inch across, the dissepiments are broken up, so as to present the true characters of *Dædalea*, to which genus the species must be referred.

592. *Hexagonia* (Pleuropus) *gracilis*, n. s.; pileo reniformi subpulvinato rufo pallescente glabro; stipite gracili elongato laterali; poris mediis hexagonis e rufo cinereis. Spruce, n. 7. (Tab. V. fig. 4.)

HAB. On the ground in Caatingas. Panuré.

Pileus $\frac{1}{2}$ –1 inch across, reniform, somewhat pulvinate, red-brown, marked with a few, delicate, raised lines, at length pallid. Stem lateral, not confluent with the pileus, cylindrical, delicate, 4–6 inches high, 1 line thick, pale umber, pruinose. Hymenium nearly plane; pores hexagonal, $\frac{1}{8}$ of an inch across, at first reddish-umber, then cinereous.

A very elegant species, exhibiting quite a new form of the genus.

593. *H. erubescens*, n. s.; pileo rigido suberoso rugoso zonato sordide umbrino demum setoso-scabro; hymenio convexo vinoso; poris flexuosis. Spruce, n. 40.

HAB. On dead trunks. Panuré, San Carlos.

Pileus $2\frac{1}{2}$ inches across, dimidiate, slightly convex, rugged, hard and corky, dirty-umber. Hymenium convex, vinous red; pores $\frac{1}{10}$ of an inch across, flexuous.

The vinous tint of the flexuous pores distinguish this species, which connects *Dadalea* with *Hexagonia*.—The Panuré specimens are nearly smooth; that from San Carlos hispidio-scabrous towards the margin, far thinner, and strongly zoned.

594. *Favolus Sprucei*, n. s.; albus, aquosus; pileo orbiculari excentrico convexo glabro; stipite deorsum incrassato; hymenio convexulo; poris hexagonis amplis. Spruce, n. 117. (Tab. V. fig. 8.)

HAB. On dead wood.

White, soft, and watery. Pileus 1–2 inches across, convex when fresh, shrinking much in drying, smooth. Stem 1 inch or more high, 2 lines thick, attenuated upwards, excentric; pores nearly 1 line broad, hexagonal, smooth within.

Allied to *F. cycloporus*, Mont., but on a larger scale. *F. manipularis*, Berk., from Ceylon, is tufted, with slender stems. *F. intestinalis* has very large pores and no stem.

* *Laschia tremellosa*, Fr. Spruce, n. 83.

HAB. On dead trunks. January, 1853. Panuré.

595. *Porothelium* (Pleuropus) *rugosum*, n. s.; pileo suberoso reniformi ovato crenato radiato-rugoso rufo-umbrino crebrizonato; margine crenato-lobato; hymenio luteolo; stipite laterali noduloso umbrino pruinoso; contextu pallido. Spruce, n. 44. (Tab. IX. fig. 2.)

HAB. On decayed trunks. Panuré.

Pileus 3 inches across, moderately thick, reniform, reddish-umber, corky, radiato-rugose, repeatedly zoned, zones often impressed; margin lobed and crenate. Stem $2-2\frac{1}{2}$ inches high, $\frac{1}{5}-\frac{1}{2}$ of an inch thick, irregular, nodulose, cylindrical or compressed. Hymenium yellowish, inclining to orange.

The pileus is very rugged and crumpled, and contrasts curiously with the yellowish hymenium, which, in consequence, looks almost like a parasite. When the pores grow obliquely, a large portion of the wall is displayed so as to present a very curious effect.—If the hymenium of this species is carefully examined, it will be found to differ in no respect from *Porothelium*. The pores are perfectly distinct on their first appearance, and it is only by confluence and elongation that they assume a character approaching that of *Polyporus*, or rather of *Fistulina*. If resupinate *Polypori* are to be retained in the genus *Polyporus*, no good reason can be given why Mesopod and Pleuropod *Porothelia* should not be retained in that genus. *P. rugosum* is connected directly with *Polyporus* by *P. variabilis*, *P. pallidus*, and several other species of this collection.

596. *Irpex Sprucei*, n. s.; mesopus, infundibuliformis; pileo ochraceo scabro; stipite elongato irregulari; hymenio albo; setis basi membranacea connexis.

HAB. On the ground, amongst roots. Panuré.

Pileus infundibuliform, $\frac{3}{4}$ of an inch across, ochraceous, rough with raised points. Stem $1\frac{1}{2}$ inch or more high, cylindrical, irregular, flexuous. Hymenium white, decurrent; teeth springing from the edge of a membranous fold.

A very singular plant, of which only a single specimen was gathered.

597. *Thelephora subclavæformis*, n. s.; brunnea; pileo e spathulato lobato-subclavæformi sursum velutino; hymenio lineatim rugoso glabro.

HAB. On the ground, with n. 84. Panuré.

Brown. Pileus $1-1\frac{1}{2}$ inch high, at first clavato-spathulate, at length deeply lobed, the lobes subclavate, somewhat crenate, velvety above. Stem confluent with the pileus, compressed, with a little white down and mycelium at the base. Hymenium decurrent, marked by linear folds.

A very singular species, and perfectly distinct.

598. *T. ocreata*, n. s.; albus, ramosus; stipite fere ad basin diviso tomento candido ocreato; ramis furcatis cylindricis apicibus acutis. Spruce, n. 11.

HAB. Amongst dead leaves. Panuré.

White, 2-3 inches high, divided almost to the base. Stem cylindrical, clothed as far as the secondary division with white, densely matted down; branches erect, repeatedly forked, cylindrical, tips acute.

Resembling *T. candida*, Schwein., but without any tendency to be compressed. Much divided forms of *T. pallida*, Schwein., also approach it, but there is little doubt that it is distinct. The younger plants are entirely involved in the white clothing.

599. *T. trachodes*, n. s.; pallida, cæspitosa; stipitibus cylindricis subtenuibus sursum furcatis processibus setiformibus scabris; ramis fastigiatis repetitè furcatis acutis. Spruce, n. 153. *Clavaria cladonina*, Bory, MSS.

HAB. On the ground. Panuré, Guadeloupe.

About $1\frac{1}{2}$ inch high, probably white when fresh, tufted. Stems slender, cylindrical, clothed as far as the second or third division with little sharp processes, somewhat resembling the persistent nerves on the stem of some Mosses; branches fastigiate, acute, scarcely compressed.

This has the habit of *T. candida*, etc., but is more delicate and finely divided, with apparently little tendency to become flat. The processes on the stem distinguish it from all other species, except *T. actiniæformis*, B.

600. *T. actiniæformis*, n. s.; stipitibus in massam cylindricam confluentibus, processibus setiformibus scabris; ramis paucis penicillatis lividis tortis apicibus laciniatis acutis. Spruce, n. 155.

About 2 inches high. Stems collected into a cylindrical mass below, white, rough with little pointed processes; branches few, forming a little brush, livid; ramuli twisted, slight, split at the tips, which are very delicate and sharp pointed.

The stem agrees with *T. trachodes* in the processes with which it is clothed; but the colour and habit are quite different. The tufts of fertile branches and the cylindrical stem remind one of some of the more elongated *Actinia*.

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(To be continued.)

On Three New Species of ACROTREMA, from Ceylon; by J. D. HOOKER,
M.D., F.R.S.

(Tab. IV.)

Since the publication of the first volume of the 'Flora Indica,' we have received many valuable contributions, including some new species, from our indefatigable correspondent, Mr. Thwaites; amongst these, none are more interesting than some species of *Acrotrema*, whose herbaceous habit and cut leaves are additional evidences of the near relation of the Order *Dilleniaceæ* with *Ranunculaceæ*.

1. *Acrotrema Thwaitesii*, H.f. et T.; pilosum v. glabratum, foliis linearilanceolatis pinnatifidis pinnatisectisve, segmentis lineari-oblongis acutis subdentatis, racemis brevissimis, bracteis lanceolatis, pedicellis gracilibus patentim pilosis.

Var. *α. pinnatifida*; foliis pinnatifidis v. basi pinnatisectis. (TAB. IV. A.)

Var. *β. pinnatisecta*; foliis pinnatisectis apice pinnatifidis, segmentis sæpissime basi contractis 3-4-lobatis.

HAB. In Zeylanicæ montosis, *Thwaites*, coll. 3364.

Rhizoma breve, horizontale, crass. pennæ corvinæ. *Folium* utrinque laxepilosa v. glabrata, membranacea, 3-5 unc. longa, 1-1½ lata, in plantis junioribus margine lobulata vix pinnatifida, segmentis setaceo-

aculeatis marginibus paucidentatis. *Petioles* brevissimi. *Pedicelli* 1-1½ unc. longi. *Flores* ¼ unc. lati. *Sepala* hirsuta. *Ovaria* basi connata, multiovulata.

The varieties of this plant (sent under the same number by Mr. Thwaites) appear very distinct at first sight; but a careful examination of the evolution of the foliage shows that the characters which distinguish them are not specific.

Plate IV. *A.* Fig. 1, flower; 2, ditto, spread open; 3, stamen; 4, carpels; 5, vertical section of a carpel:—*all magnified.*

2. *Acrotrema dissectum*, Thwaites; sericeo-pilosum, foliis lanceolatis abrupte pinnatisectis, pinnis majoribus pinnatifidis segmentisque setaceo-acuminatis minoribus interjectis parvis lanceolatis inæqualibus, racemis brevissimis, pedicellis elongatis patentim pilosis. (TAB. IV. *B.*)

HAB. Prope Hellessee, ins. Zeylanicæ, *Thwaites*, n. 3393. Mai. 1855. *Rhizoma* breve, crassiusculum. *Folia* brevissime petiolata, 3-5 unc. longa, 1 unc. lata, membranacea, subtus albido-sericea, pinnis breve gracile petiolulatis obovato-lanceolatis. *Flores* ½ unc. lati. *Carpella* polysperma, seminibus grosse foveolatis.

3. *Acrotrema lyratum*, Thwaites; glabrum v. parce pilosum, foliis coriaceis basi pinnatifidis lobulis rotundatis despectis superne in laminam amplam oblongam obtusam basi cordatam dilatatis margine subdenticulatis, racemis longe pedunculatis, bracteis imbricatis recurvis, pedicellis elongatis floribusque glabris, ovulis plurimis.

HAB. In insula Zeylanicæ ad Hinidoon Korle, *Thwaites*, n. 3392. Mai. 1855.

Habitus et sæpe statura *A. Arnottiani*, Wight.—*Rhizoma* crassum, ascendens. *Folia* 3-10 unc. longa, lyrato-pinnatifida, laminæ parte superiore maxima, 2-7 unc. longa, 2-4 lata, nervis crassis horizontaliter patentibus apicibus furcatis, parte inferiore laminæ (v. parte superiore petioli) pinnatifida, segmentis parvis orbiculatis late adnatis despectis. *Petiolus* brevis, crassus, basi in stipula vaginante dilatata. *Inflorescentia* glabra. *Pedunculus* 1-3 unc. longus, nudus, superne bracteis imbricatis recurvis tectus, pedicelli 1 unc. longi, sæpe decurvi. *Flores* fere ½ unc. lati.

Variat insigniter statura.

Besides the above, we have from Mr. Thwaites one specimen of another *Acrotrema*, numbered 3114, which, with the leaves of *A. lanceo-*

latum, has the inflorescence of *A. uniflorum*, and may be different from either. The other two Ceylon *Acrotremas* are excessively variable plants; they are *A. lanceolatum*, Hook., of which Mr. Thwaites has lately sent specimens with obtuse apices to the leaves, and which we have under his numbers 253 and 2660; and *A. uniflorum*, Hook., of which Mr. Thwaites sends specimens with the leaves acute at the base; to this we have referred his numbers 239, 265, 693, 694, 1014, and 2659, several of which appear exceedingly dissimilar, but are united by intermediate forms from Walker and other collectors.

BOTANICAL INFORMATION.

*Extract from the Report of DR. FERDINAND MUELLER, the
Government Botanist of Victoria.*

Botanic Gardens, Melbourne, 25th June, 1855.

Sir,—I do myself the honour of transmitting for communication to His Excellency the Governor my Third General Report.

Having received, in October, 1854, His Excellency's sanction for a more extensive phytologic exploration of the Australian Alps, I left for Gipps' Land on the 1st of November, 1854.

Whilst travelling along the banks of the La Trobe River and the Avon, I had ample opportunities for convincing myself that an extensive tract of that country, on account of the fertility of its soil, the mildness of its climate, and the facility of clearing land there for agriculture, is undoubtedly destined to become, when the internal communication there has been more facilitated, the abode of a large and prosperous population.

Proceeding along the ranges of the Avon, which are generally barren, scrubby, and in many places densely timbered, I ascended Mount Wellington, the most southern summit of the Australian Alps, on the 22nd of November, 1854, from whence I added some highly interesting plants to our botanical collections. At the elevation of about 4000 feet above the sea-level, or at a subalpine altitude, a striking change is perceptible in the vegetation, since the valleys and plateaus, stretching from Mount Wellington to the north, and more or less westerly and easterly, are well saturated with moisture, both from the attraction of

clouds, and from the dissolving snow, which, lying there for many months in the year, has given to these localities the appellation of "The Snowy Plains."

The route thus followed is the most practicable for penetrating from this part of Gipps' Land into the central mountains of the Alps, although an easier access yet may be found to them from Omeo, by following the generally grassy ranges to the westward from a few miles above the junction of the Livingstone River with the Mitta Mitta.

Proceeding on a second journey along the Darga, which flows through some luxuriantly grassed recesses of the mountains, I advanced through a difficult country to the Bogong Range, the culminating point of the westerly system of the Snowy Mountains; a dense scrub, and the total absence of water on the crest of the Wentworth Ranges, rendering the progress tedious, until I reached the Dividing Range towards the sources of the Cabongra, where again the feature of the country changes on the northern slopes of the mountains, or along the sources of the Murray tributaries. Here open valleys give access to the central ranges in almost every direction, and a profusion of grass and water attracts cattle during the summer months far into these mountains. The low scrubby underwood disappears with Stringy-bark and Box, *Eucalypti*, and the dwarf forests of mountain Gum-trees, which replace them, may either be avoided or offer but little obstruction to the progress of a traveller.

According to a special report, which I had the honour of transmitting to the Government, dated Omeo, 16th December, 1854, I succeeded in reaching not only two of the main sources of the Mitta Mitta, but also the two most elevated heights of the Bogong Range; these perhaps not even previously trodden by the aborigines, since game and brushwood cease far below the summits. The two highest mountains, which I had the honour, by His Excellency's sanction, to distinguish as Mount Hotham and Mount La Trobe, are along the terminal ravines covered with eternal snow. It will be unnecessary to repeat here the respective bearings which I took from these all-commanding heights, since they are detailed in my special report; but it remains for me to confirm my computation with regard to their altitude. My calculations, based on the boiling-water point, proved, after my return, that the summits of the Bogong Range are unsurpassed by any other known of this continent, approaching to the altitude of 7000 feet above the level of the

ocean. A depressed Glacier Flora, imitating in some degree the botanical features of the European and other Alps, covers scantily the icy tops.

The bearings from the summit of Mount Tambo, instituted on the 17th of December, 1854, gave the position of Mount Hotham due W., of Mount La Trobe, W. 4° S.

From Omeo I resumed my journey into the north-easterly systema of our Alps, through a delightful subalpine country, opening into wide valleys at the main sources of the Snowy River, many of these valleys well adapted and partially used for summer pastures.

I ascended the most northern alpine hill of the Munyang Mountains on the 1st of January, 1855, and traversed in the weeks subsequent most of the principal elevations of these prodigious mountains, adding also there again not inconsiderably to our herbarium. Here on very many places the waters of the Murray and the Snowy River are rising in the closest proximity.

Descending, in the latter part of January, along the Snowy River to the lower country, I advanced as far easterly through the coast tract as the boggy nature of the country permitted, and I devoted my attention here again to the Flora of the Palm-tree Country, to improve my knowledge of the interesting plants discovered here previously in a more advanced season.

But the full botanical investigation of the south-eastern portion of this Colony, which, under the mildest climate, abounds in subtropical plants, can only be accomplished from the New South Wales frontier.

Returning from the Snowy River, I deemed it more promising to prosecute my operations on the coast, along which I proceeded to Lake King. Here I observed, amongst other rare and unknown plants, some fine trees of *Acronychia*, a genus known from Eastern Australia and New Caledonia, remarkable for its splendid wood, and the aromatic property by which the species are pervaded.

A most severe illness frustrated my intention of ascending Mount Bow Bow, a wild, rocky, isolated summit at the south-western slope of the Australian Alps, hitherto unexplored, and perhaps the only locality from which additions may be expected of importance to our knowledge of the Alpine Flora.

Reflecting on the general results of this journey, I trust to be justified in considering them not without some importance, at least for

the geography of plants. The expedition was planned more with a view of ascertaining the alliance between the vegetation of the Alps of Australia and plants of other countries, than with anticipations of largely enriching thereby the number of plants already under notice. Still, by referring to the enumeration annexed to this document, and to my former annual reports, it will be observed that the total amount of either truly alpine, or at least subalpine plants of this country, exceeds one hundred species, and it is pleasant to perceive that half of these are endemic, or not yet elsewhere discovered; whilst by far the greater part of the other half comprises such as inhabit Tasmania, or are likewise natives of New Zealand. A much smaller proportion is identical with plants found exclusively in New Zealand, or Lord Auckland's Group, or Campbell's Island. The genus *Drapetes*, for a long time only known in Fuegia, is now ascertained to exist, with other plants from the cold zone of South America, in the Australian Alps, New Zealand, Tasmania, and Borneo, and many other instances might be adduced to show the typical resemblance of many plants from the Alps of Australia with those of distant countries. As a most surprising fact in this regard, I beg to allude to the sudden reappearance of several European plants in the heart of the Australian Alps, plants which may be searched for in vain in the intervening country, viz.:—*Turritis glabra*, *Sagina procumbens*, *Alchemilla vulgaris*, *Veronica serpyllifolia*, *Carex pyrenaica*, *Carex echinata*, *Carex canescens*, *Carex Buxbaumii*, and *Botrychium Lunaria*. I may also advert to the occurrence of *Lysimachia vulgaris* in the Gipps' Land morasses as another singular instance of the enigmatic laws which rule the distribution of plants, and I cannot suppress my opinion that such facts tend to annihilate all theories in favour of migration of species from supposed centres of creation.

The Index which I have annexed comprises also a large number of Seaweeds, discovered by Professor Harvey, and adds thus 96 genera and 327 species to my previous enumerations, advancing the number of the former to 776, a sum which, as excluding all yet introduced plants, all Fungi, and many undetermined genera of the lower Orders, must be considered eminently large. The number of species ascertained to occur in Victoria exceeds, under the exclusions alluded to, already 2000. Excluding all Algæ, 15 genera have been added to the Flora of this Continent, two of them new to science—*Caltha*, *Howillia*, **Colobanthus*, **Dichopetalum*, *Pozoa*, **Diplaspis*, *Seseli*, †*Diodia*, **Ner-*

tera, **Decaspora*, †*Pæderota*, **Drapetes*, **Herpolirion*, **Astelia*, and **Andreæa*.

Seeds of native plants were collected, whenever obtainable, and have been distributed (in more than 1000 lots) with a view of increasing by interchange the supply for our own establishment to the best advantage. It is my pleasing duty to acknowledge here the valuable contributions for our gardens, received in return for my former collections, amongst which contributions those of Sir William Hooker, from the Royal Gardens at Kew, are prominent.

Engagements in the botanical perlustration of tropical Australia, for which His Excellency has been pleased to sanction my absence for the next and the current year, render it impossible to devote any time for the most desirable researches into the utility of so many of our native plants; but I have succeeded in finishing my systematic labours on the Flora of Victoria, so far as the material for it was accumulated, and an outline of the more interesting new plants has been furnished for the Journals of the Philosophical Society and the Victorian Institute. A more extensive information on our native plants was forwarded to Sir William Hooker, and I trust that, on account of the great alliance of the Victorian and Tasmanian plants, these manuscripts will prove to be useful in the elaboration of the Flora of Van Diemen's Land, which is now to be published, under the auspices of the Imperial Government, by Dr. J. D. Hooker.

A splendid collection of Algæ, procured on our shores by Professor Harvey, forms a valuable addition to our herbarium. The whole of the collections may at all times be consulted in the Botanic Garden; and I hope sincerely that the labour which I have bestowed on these collections will not be in undue proportion to the information which they are intended to convey.

A regular transmission of botanical specimens to Kew has also been continued. Steps have likewise been taken to procure from other countries such plants as promise to become of use to the colony; and it is gratifying to know that Nature has favoured us with a soil and with a climate in which all treasures of the vegetation dispersed through extratropical countries may be reared in perfection and abundance.

* Those thus marked had previously been detected in Tasmania.

† These do not belong to the genera to which they are referred.

NOTICES OF BOOKS.

GÉOGRAPHIE BOTANIQUE RAISONNÉE, ou *Exposition des Faits principaux et des Lois concernant la Distribution Géographique des Plantes de l'époque actuelle*; par M. ALPH. DE CANDOLLE. 2 vols. 8vo. Paris.

(Continued from p. 191.)

Concluding remarks.

We have now concluded the agreeable task we undertook, of passing under review the principal features and some of the principal facts contained in M. de Candolle's valuable work. This we have been the more willing to do from the conviction that, owing to its great bulk, and the considerable amount of botanical knowledge required to follow any part of it, the chances of its perusal by the general reader are much smaller than its merits deserve, and we would try to assure M. de Candolle that he would confer a further benefit upon scientific botanists, and diffuse a knowledge of the curious and difficult subject he has shown himself so well able to discuss amongst a large class of intelligent readers, if he would prepare a condensed edition of his work. In its present form it is too encyclopedic in extent and too diffuse in style to become an introduction or text-book on the one hand, or a work for general reading on the other. In the second volume especially there is a good deal of repetition, and unnecessary subdivision of the subject into chapters, articles, and sections.

The Articles devoted to a few Meteorological questions and to the Geographical origin of cultivated plants are, however excellent in themselves, out of place as here treated in detail, and would make good foundations for separate treatises. In their present shape they cannot be said to throw any light upon Botanical Geography, nor do they indicate any new laws nor suggest any new modes of searching for them. The absence of originality indeed throughout the volumes is perhaps not their least striking feature, and is to be attributed to the comparative barrenness of the subject in this respect, and not to any lack of ingenuity, and still less of knowledge or industry, on the part of the author; and yet it appears that some perfectly original course of study must be adopted or some new ideas must be conceived, in relation to the subject of Botanical Geography, before further advance can be attained in the direction now being followed,—some such bold

original ideas as led Lyell first to conceive and then to prove that species may be older than the lands which they now inhabit, and that led Edward Forbes to seek in the distribution of the fossil remains of existing British species a key to their present diffusion.

It remains to say a few words upon the general subject of Botanical Geography. It is no fault of M. de Candolle's work that we lay it down more impressed than ever with the vagueness of its principles, the inexactness of its methods, the puzzling complexity of its phenomena, and the purely speculative character of those hypotheses upon which all inquirers base their efforts to explain its facts and develop its laws.

Much stress is laid upon the value of Meteorological observations, but there is no method of tabulating these that offers a prospect of their being applied to the solution of any one general question in the distribution of species. Certain plants will not survive temperatures above or below a given number of degrees; or in other words, certain sums of temperatures are necessary to the fulfilment of their functions: this all the world knows; but the tabulation of these temperatures has hitherto led to no general laws, for not every family of plants, nor every genus, nor even every species, but often every variety or race, must have its own sum of degrees to ensure its continued existence. Nor is this all: the sum of degrees must extend annually over a certain definite period of the year, and must be accompanied with so many favourable conditions of soil, light, moisture, and purity of air, that the mere question of temperature becomes a very subordinate element, however accurately ascertained. So far, then, as Meteorological observations are concerned, we must consider that, however accurate they be, they have hitherto admitted of no exact practical application with reference to the distribution of species, nor have they even indicated a theoretical approximation to it.

Next with regard to the limitation of species, genera, and families, within certain areas; this again is subject to no appreciable laws; plants are no doubt governed in their diffusion by conditions of climate and soil, and are dependent for their diffusion on their own powers of endurance, on the time that has elapsed since they first existed as species, on the elements, on the motions of animals, and on geological changes; but we not only know nothing in any case of the time elapsed, and next to nothing of the geological changes they may have survived, but all our attempts have failed to regulate their distribution

in elevation or latitude or longitude, by climate, or soil, or other external conditions. Species, Genera, and Orders stop, we see not why, and often reappear where we least expect them. Under this head too must be noticed the fact that there is none of that recognizable relation between structure and function, or structure and external conditions, in the vegetable kingdom that there is in the animal, and which often enables us to account for a fact in the distribution of an animal by another in that of a plant. We see the limit of some animal's distribution coinciding with that of the plant it lives upon or under, or that nourishes a third animal it preys upon; but we never see the plant stopped by or for the animal. There are comparatively few evidences of plants being structurally better suited to one situation than to another, with the exception of a few conspicuous classes, as water-plants, epiphytes, parasites, etc.; and hence our power of accounting by physical causes for the facts of Botanical Geography is extremely limited.

If, again, we turn from those branches of the subject, in reasoning upon which we make use of facts and observations however inexact or difficult of application, to the fundamental principles upon which the study is based, and from some of which we must start in all our investigations, we enter at once into the regions of pure speculation. Nor can there be better proof of the facts and hypotheses advanced being insufficient to explain Geographical distribution, than is afforded by the circumstance that even M. de Candolle, with all his philosophy and desire to arrive at exact conclusions, is compelled to resort to the unphilosophical proceeding of demanding the operation of two laws to account for each of the two primary phenomena connected with the creation of species.

Thus, with regard to their origin, he considers that most are special creations, but that some are the offsprings of transmutations; and with regard to the number created and place of creation, that some are created as solitary individuals or as a plurality of individuals in one place only; and that others are (simultaneously?) created in several more or less distant localities.

We are told that the majority of species were created such as they now exist, but there is not a shadow of a proof of this. No amount of acute observation or critical disquisition throws real light upon this subject, upon which men of science are completely at issue; nor is there in the present state of science any prospect of naturalists

agreeing upon it. There are, as it appears to us, two broad facts, and only two, to which all naturalists must turn who seek some foundation for an opinion as to the origin of species, and these lead to diametrically opposite conclusions. They are, on the one hand, that a great number of specific forms are hereditary in as far as our experience allows of our judging; on the other, that a great number are extremely variable, and that races with characters as strongly marked as those of species are constantly being produced under our eyes.

M. de Candolle belongs to the school who attach most importance to the first fact, and he has put every argument that can be brought forward in support of the conclusion to which it leads in the clearest manner. He has also attended to all the facts that militate against it, and if we do not think he has given them due prominence, it is from no want of candour on his part, but solely from our considering that he is not aware of their extent. We believe that species are very much more variable than he does, and that the number of proved and probable permanent races (now regarded by most naturalists as species) is much more numerous also. We do not indeed consider that the question of species being definite creations is hence disposed of; for if true, it proves no more than that there are fewer species than some Naturalists suppose.

Let us now treat this side of the question upon its own merits. Its advocates start with the fact that species are variable, and they assert that this statement requires no qualification, whereas that of their hereditary distinctness demands the qualification of "within our experience." But it has been shown that existing causes, and the range of "our experience," will not account for a single fact in the present distribution of species, nor for the geographical origin of any, nor for the amount of variation it has undergone, nor will it indicate the time when it first appeared, nor the form it had when created; in many cases it will not even help us to discriminate a species from a variety, or a hybrid from a species, or a monster from a perfect plant. What, then, the opponent of the theory of definite creations asks, is the value of the range of "our experience" in so momentous a question as this. Time and altered conditions have, he says, within our experience, produced races that have not reverted to their typical form; it is allowed by the advocates of special creations, that these have operated from periods which antedate the range of our experience, in confounding

some races with species, beyond the probability of their being ever discriminated;—and that more time and more altered conditions should suffice to effect such further change as to produce the many existing vegetable forms out of a few pre-existing ones, seems to him a perfectly legitimate conclusion. He argues too, and with great plausibility, that this theory of transmutation accounts better for the aggregation of Species, Genera, and Natural Orders in geographical areas, and for their limitation; whilst he leaves it to geological change, and altered climatal and other physical conditions, to account for their subsequent segregation and ultimate destruction.

We have hitherto treated the question as naturalists cannot help doing, trammelled with facts and difficulties that have a different value in different naturalists' eyes; but the general inquirer, who has nothing to do with facts, and knows nothing of species or varieties, will treat it in what appears to him a more philosophical manner: he will ask himself whether it is most accordant with the operation of Natural Laws, that the Oak-tree or Acorn should have appeared suddenly, as a special creation, on the surface of the globe, or be an altered form of a pre-existing tree, of greater or less complexity of structure; and will doubtless choose the latter hypothesis as involving less of the marvellous at first sight, and appearing to explain the mystery of creation. But unfortunately transmutation brings us no nearer the origin of species, except the doctrine of progressive development be also allowed,* and, as we can show, the study of plants affords much positive evidence against progressive development, and none in favour of it.

The main facts of Fossil Botany, though few, are well established, and their significance in relation to the question of progressive development is, we think, quite clear. They are—

That *Lycopodiaceæ* existed, and are amongst the earliest known land-plants (in the Carboniferous period).

That they were accompanied by many genera and species of Ferns.

* *Apropos* of this argument, as applied to account for the origin of species, we may quote the opinion of the able author of an article in the *Medico-Chirurgical Review*, on the well-known 'Vestiges of the Natural History of the Creation':—"If, with the Progressionists, we conceive that species of living beings undergo transmutation at the present day; that this transmutation is from a lower to a higher type; and that all the kinds of living beings which have ever existed upon the earth's surface have originated in this way; the idea is a perfectly legitimate one, and must be admitted or rejected according to the evidence attainable; but if fully proved, it would not be, in any intelligible sense, an *explanation* of creation; such 'creation in the manner of natural law' would, in fact, simply be an orderly miracle."

That *Coniferae* are the only other Natural Order, of whose existence, at the same period, there are any very strong indications.

That *Cycadeæ* existed abundantly at the period of the Lias and Oolite, if not earlier, along with the above-mentioned Families.

That various other Dicotyledonous Natural Orders existed in the time of the Chalk.

The interval of time embraced within these periods, whether greater or less than has since elapsed, is sufficient to ensure our not taking too limited a view as regards time; the botanical facts again are incontestably the leading ones of those periods; and the conclusions to be derived from a study of them are—

That the various Dicotyledonous Natural Orders of the Chalk afford no proof of being higher nor lower in development than those of the present day, but much of their being equal in rank; that the *Cycadeæ* of the Lias and Oolite are certainly as highly organized as their existing allies; that the *Coniferae* are too imperfect to afford the smallest evidence of their relative development; that the Ferns of the Oolite and Coal are as highly organized as those of the present day; and that the *Lycopodiaceæ* of the Carboniferous epoch are, in general structure, the same with those now existing, but were very much more highly developed in stature and organization.

It is further to be remarked that the above Natural Orders embrace some of the most highly organized in the vegetable kingdom; though with regard to that which we consider as amongst the very highest, namely the *Coniferae*,* the evidence is the most incomplete as to the perfection of its members, as compared with those now existing.

The only arguments hitherto adduced in favour of progressive development, drawn from the vegetable kingdom, are, we think, very

* That the *Coniferae* occupy so high a place in the scale of Phænogamic plants as we would assign them, will be disputed by those who attach more importance to their defective floral envelope and ovary, than to the astonishing complexity of their reproductive organs, the perfection of their woody tissues, the rarity or absence of spiral vessels, except in their rudimentary tissues, their physiological peculiarities, and especially the slow development of the pollen-tube, etc., and operation of fecundation. In the development of their ovules and pollen they rank far above all other flowering plants, as also in the anatomy of their wood, and their numerous cotyledons, etc., whilst in all that regards the structure of their seed, their germination, and the development of their axis, they are perfectly and typically Dicotyledonous, Exogenous, Exorhizal, and Acramphibryal. Besides these points, *Gnetum* has both a perianth to the male flower, and either a perianth or ovary to the female, for the external covering of the ovule is certainly not (as Griffith supposed) a primine; so that if the group of Gymnosperms be retained, its characters must be modified.

easily disposed of; the first of these is the assumed presence of *Algæ* in rocks older than those containing land-plants. Now the presence of *Algæ* in the water is no proof of the absence of land-plants, and the *Algæ* may, if present, have been more highly organized than any now existing; but we have seen no evidence of *Algæ* amongst the so-called Fucoids of the protozoic rocks; what we have seen to be so called are appearances that pass the inventive powers of palæontologists to explain naturally, are sometimes inorganic matters, and at others, casts of *Bryozoa* whose structure is lost. In no case does a so-called Fucoid present any proof of being an *Alga*; in most cases it is so considered only because it is not recognized by the zoologist as belonging to his kingdom.

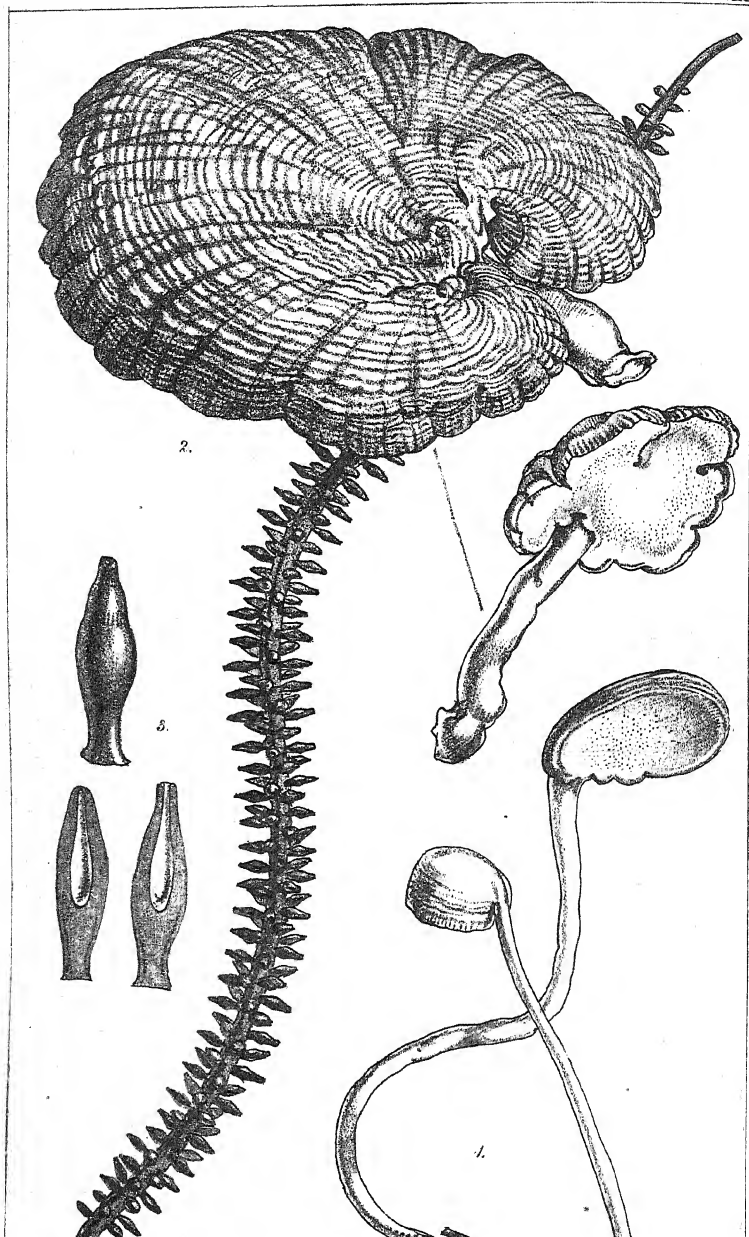
The second argument is the assumed inferiority of the Gymnosperms, which we dispute; and the third is the assumed absence of any Angiospermous Dicotyledons, or of Monocotyledons below the Chalk, and which was a few years ago assumed of the Chalk also. But not only are there indications of true Palms, and of other Orders, in the Coal, but the capital experiments of Lindley, who tested the powers of resisting decay, possessed by various Natural Orders, show that Ferns, *Coniferæ*, *Lycopodiaceæ*, and *Cycadeæ*, are the most imperishable under water, which, taken with the fact that the formation of coal is due, in part at least, to a local and not to a promiscuous assemblage of plants, representing the vegetation of the period; and the force of the very weak argument, founded on the absence of certain Orders, is reduced to a shadow.

The only other theoretical point to which we shall allude, is the appearance of species (whether as creations or transmutations) in one spot or in many spots. Here again we have no evidence to guide us, and can only assume a position, as in the former cases, upon the broadest view of the facts of distribution; now it is undisputed that the most prominent feature in distribution is that, as a general rule, species are grouped in more or less restricted areas, after a manner that is quite consistent with the hypothesis of their having spread from one spot. The exceptions may be very numerous, and the question remains, how may those cases be most easily accounted for which cannot be explained by migration; if by a double creation of the same species, we wander further into the regions of pure hypothesis; but if by transmutation, we may assume that the power that species have of forming races, has been developed at two or more spots instead of one. This demands

less of the marvellous than the hypothesis of a double creation, and allows more latitude for variation: for whereas it is adding miracle to miracle to assume the same species to be created not only at two or more spots, but at two or more times, and under two or more forms; it is but extending one law now in operation to suppose that this would happen if transmutation thus gave origin to races and species; for the conditions that induce the change, and hence the race, need not have occurred at the same time at two or more spots, nor when they did occur would they act with equal power or upon exactly similar individuals, whence the individual races would not be altogether similar.

We have thus endeavoured to put the argument in favour of transmutation in as strong a light as we believe it to be capable of bearing in the existing state of our knowledge. For our own part we confess that we see no more means of forming an opinion on the subject of the origin of species, than we do of the origin of time; whether they are all suffering transmutation or not, appears to be immaterial as regards the progress of botanical science; on the one hand we cannot treat practically of the species of plants, either systematically or physiologically, save under the assumption that most are hereditarily permanently distinct; and on the other, we cannot study any species or organ physiologically or morphologically without being strongly impressed with the fact that variability is an ever-operating law.

Species of plants are so far constant as to admit of their being treated upon the whole as if they were permanent creations; and though so plastic under altered conditions, they are capable of better and more natural systematic arrangement and circumscription by characters than minerals, climates, or diseases. The difference between the views of those who advocate the theory of the creation of species by transmutation, and those who believe in a special creation, is very wide perhaps, but not so wide as to allow of their employing different methods towards the advancement of Botany in any one of its departments. For ourselves, we believe that fully one-half of the registered species of plants are reducible to races or varieties; with regard to the other half, whatever their origin may be, they are, in comparison, permanently distinct as species. That these species do run into varieties; that two or more of them may have originated in an altered state of some pre-existing form, or may in the course of ages assume still other forms, is perfectly intelligible; but for any such species so to change as to assume all the characters of another within the limits of our ex-



*A List of the MUSCI and HEPATICÆ collected in Victoria, Australia, by
Dr. F. Mueller; by WM. MITTEN, Esq.*

I. ANDREÆACEÆ.

1. *Andreæa Australis*, F. Mueller, MSS.; dioica, caule elongato-ramoso, foliis patentibus ovatis ovato-lanceolatisque acutatis nervo excurrente, perichætalibus late ovatis acuminatis nervatis omnibus minutissime areolatis lævibus, theca exserta ad $\frac{3}{4}$ fissa.

HAB. Munyang Mountains. (No. 23, 85, 1855.) Australian Alps. (No. 16.)

Nearly resembling some of the larger states of *A. Rothii*, var. *Grim-sulana*, but distinct from it in the wider, suddenly sharpened apices of its leaves, their narrower, more distinct nerve, and far more minute areolation. The inflorescence appears to be truly dioicous.

II. BRYACEÆ.

1. DICRANOIDEÆ.

2. *Pleuridium nervosum*. (Phascum, Hook.) (No. 82, 1855.)
3. *Leptotrichum flexifolium*. (Dicranum, Hook.) (No. 17, 64, 1855.)
4. *L. affine*, C. Mueller. (*Trichostomum setosum*, Hook. fil. et Wils.) (No. 19, 66, 72.)
5. *Dicranum tenuifolium*, Hook. fil. et Wils. (No. 12, 44, 82, 1855.)
6. *D. Billardieri*, Schw. (No. 3, 98, 105,—149, 1855.)
7. *D. Menziesii*, Tayl. (No. 63,—46, 100, 1855.)
8. *D. (Campylopus) torfaceum*, B. et S. (No. 30, 1855.)
9. *D. (Campylopus) introflexum*, Hedw. (No. 75, 80, 1855.)
10. *Leucoloma Sieberi*, Brid. (No. 119.)
11. *Didymodon papillatus*, Hook. fil. et Wils. (No. 136.)

The decurrent portions at the base of the leaf of this Moss equals half its length.

12. *Ceratodon purpureus*, Brid. (No. 10, 33, 42, 68, 71, 75, 94,—50, 70, 129, 1855.)
13. *Holomitrium perichætiale*, Brid. (No. 128.)
14. *H. cirrhatum*. (Weissia, Hedw.) (No. 65, 1855.)

Although Bridel made some mistakes about the characters of his genus *Olomitrium*, no good reason has yet appeared why it should be rejected, particularly as Hornschuch has added to it some others inti-

mately allied to the original species ; besides which there should be added *Weissia crispula*, Hedw., *W. compacta*, Schw., *W. fastigiata*, Taylor, *W. tortifolia*, Hook. fil. et Wils., *W. pomiformis*, Hook., *Syrrihopodon Dregei*, Hsch., and *S. clavatus*, Schw., all agreeing closely in habit and in the structure of their leaves and fruit ; from *Weissia*, as represented by *W. controversa*, they recede in the cell-structure of the leaves, which approaches very nearly to that of *Dicranum*, without however having the glossy appearance usual in that genus.

2. POTTIOIDEÆ.

15. *Phascum cylindricum*, Tayl. (No. 127, 1855.)
16. *Weissia flavipes*, Hook. fil. et Wils. (No. 60,—77, 1855.)
17. *Desmatodon nervosus*, B. et S. (No. 132,—41, 146, 1855.)
18. *D. adustus*, Mitten ; dioicus, caule gracili ramoso, foliis patentibus ovatis acutis concavis margine maxime revoluti, nervo crassiusculo excurrente, dense papilloso, perichæcialibus latioribus tenuioribus margine non reflexis, theca in pedunculo gracili elongato cylindrica erecta, operculo conico-rostrato.

HAB. Gipps' Land. (No. 78, 1855.)

Near to *D. Schimperii*, Mont., but differs in its wider, acute leaves, not cucullate and obtuse, and in the shorter and broader perichæcial leaves. The peristome appears to have the same structure.

19. *Tortula calycina*, Schw. (No. 9, 43, 127, 147,—40, 73, 1855.)
20. *T. Tasmanica*, Hampe. (No. 149,—165, 1853.)
21. *T. Hornschuchiana*, Schultz. (No. 33.)
22. *T. luteola*, Mitten ; dioica, caule erecto ramoso, foliis patentibus lanceolatis ovato-lanceolatisve obtusis nervo in mucronem flavum excurrente, perichæcialibus ovato-lanceolatis sensim acuminatis, theca in pedunculo aurantiaco cylindrica, operculo subulato, annulo simplici, peristomio dentibus e basi brevissime coadunato longiusculis pluries contortis.

HAB. Yarra. (No. 132, 1855. No. 47.)

Larger than *T. unguiculata*, and distinct from it in the subulate points of its perichæcial leaves ; in other respects very closely allied to it, and like it very variable in the width of its leaves.

23. *T. Australasica*, Hook. et Grev. (No. 35, 142.)
24. *T. serrulata*, Hook. et Grev. L.
25. *T. princeps*, De Notaris. (*T. Mülleri*, Bruch.) (No. 37, 116, 1855.)

26. *T. papillosa*, Wils. (No. 121.)

The fertile specimens present no differences from the barren plant found in Britain. The seta is thick, about four or five lines long, the capsule cylindric, the operculum about two-thirds as long as the capsule, the peristome that of *Syntrichia*—the tubular portion being one-third of its whole length. Gemmæ are, as usual, present on all the leaves, excepting those of the fertile stems.

27. *Encalypta ciliata*, Hedw. ? (No. 79, 1855.)

Without calyptra or operculum, but appearing to belong to this species.

28. *Grimmia pulvinata*, Hook. et Tayl., var. β *Africana*. (No. 20, 36, 37, 48,—76, 1855.)29. *G. (Racomitrium) lanuginosum*, Brid. T.30. *Zygodon Brownii*, Schw. (No. 3,—41, 1855.)31. *Z. intermedius*, B. et S. (No. 17.)32. *Z. Menziesii*. (Codonoblepharum, Schw.) (No. 45.)33. *Orthotrichum Tasmanicum*, Hook. et Wils. (No. 21,—39, 1855.)34. *Macromitrium microphyllum*, Hook. et Grev. (No. 14, 122.)

3. FUNAROIDEÆ.

35. *Physcomitrium pyriforme*, Brid. (No. 58,—95, 1855.)

36. *P. firmum*, Mitten; caule elongato, foliis obovatis obtusiusculis caviusculis, nervo tenui sub apice evanescente, margine subintegerimo, perichætalibus conformibus, theca in pedunculo crassiusculo pyriforme ore amplo.

HAB. Dilalili. (No. 80.) Rare.

Leaves shorter, wider, and more concave than those of *P. pyriforme*, cells shorter, those of the margin minute, substance of the leaf firmer. The seta appears to be slightly curved. The operculum and calyptra are absent.

37. *Entosthodon apophysatus*. (*Physcomitrium, Taylor.*) (No. 131,—120, 1855.)38. *E. laxus*. (*Physcomitrium, Hook. fil. et Wils.*) (No. 132, 1855.)

The old capsules on these specimens are obovate, the neck rather inflated, not gradually tapering into the seta, which is about half an inch in height.

39. *Funaria radians*. (*Weissia, Hedw. F. glabra, Taylor.*) (No. 119,—81, 1855.)

40. *F. hygrometrica*, L. (No. 123, 1855.)
 41. *Eremodon Octoblepharis*, Hook. (No. 13, 15, 104, 105, 109, 129.)
 42. *Meesia macrantha*, Mitten; monoica, cæspitosa, caule ramoso breviusculo, foliis lanceolatis obtusis margine recurvis nervo sub apice evanido, perichætialibus longioribus, theca in pedunculo elongato pyriformi curvula, operculo conico obtuso, peristomio externo dentibus brevibus obtusis, interno processibus longis carinatis rugulosis, flore masculo in ramulo brevi, foliis perigonalibus latissime ovatis acuminatis obtusis.

HAB. "In sphagnetis Montis Cobboras rarissima."

Similar to *M. uliginosa*, but its leaves are wider, with wider cells, and the margin plane or recurved, but not reflexed. The perigonal leaves are remarkably wide at their bases, and the male flower large for the size of the Moss.

4. BARTRAMOIDEÆ.

43. *Bartramia* (*Bartramidula*) *curvirostra*, Mitten; monoica, conferte cæspitosa, caule brevi ramoso, foliis erecto-patentibus lanceolatis margine apicem versus remote serratis, nervo crasso dorso denticulato apice in mucronem subulatum lævem excurrente, perichætialibus longioribus lanceolato-subulatis nervo tenuiore, theca in pedunculo brevi flexuoso spherica lævissima ore parvo gymnostoma, operculo conico-subulato incurvo, flore masculo in ramulis terminalibus innovatione laterali.

HAB. Australian Alps. (No. 83.) Munyang Mountains. (No. 83, 1855.)

Resembling *B. Wilsoni*, B. et S., but the whole plant a little more robust, the seta thicker, the operculum as long as half the diameter of the capsule, and always much incurved.

44. *B. (Conostomum) pusilla*, Hook. fil. et Wils. (No. 31, N.—43, 1855.)

45. *B. (Philonotis) appressa*, Hook. fil. et Wils. (No. 9, 1855.)

The capsule of this curious species is globose, sulcate, and rather large for the size of the Moss, the operculum conic. The peristome appears to be normal, but rather tender. The whole plant is of an ashy-green colour and everywhere densely papillose; it is not very closely allied to *B. laxissima*, C. Mueller.

46. *B. (Philonotis) fertilis*, Mitten; monoica, caule elongato gracili

ramoso, foliis patentibus e basi ovata lanceolato-subulatis margine ubique serrulatis nervo percurrente dorso scabro, e cellulis laxis areolatis, perichæcialibus magis subulatis subintegerrimis, theca in pedunculo elongato oblonga plicata operculo conico, peristomio normali, flore masculo foliis perigonalibus acutis terminale fœmineis pluribus cincto.

HAB. Bogong Range. (No. 112.) Australian Alps. (No. 133, 1855.)

In size not unlike *B. tenuis*, Tayl., but more nearly allied in the monoicous inflorescence to the species I understand as *B. radicalis*, in which however the leaves are not more than half so wide.

47. *B. (Brentelia) affinis*, Hook. (No. 1, 54, 57, 63, 65—35, 1854.)

48. *B. (Brentelia) pendula*, Hook. (No. 72.)

49. *B. (Eubartramia) Halleriana*, Hedw. (No. 4, 1855.)

50. *B. (Vaginella) papillata*, Hook. fil. et Wils. (No. 140, 157, AA.—28, 38, 74, 1855.)

5. BRYOIDEÆ.

51. *Orthodontium lanceolatum*, Mitten; monoicum, caule brevissimo, foliis patentibus recurvis lineari-lanceolatis planiusculis, nervo sub apice evanido, theca in pedunculo gracili recto ovali, collo pyriformi attenuato, operculo conico rostrato, peristomio *O. Australis*.

HAB. Mount Wellington, Gipps' Land. (No. 61.)

Less than *O. Australe*, with leaves twice as wide, and less narrowed upwards. Capsule erect, with a longer neck, scarcely striate.

52. *Mielichhoferia Eckloni*, Hsch. (No. 126, 1855.)

53. *Bryum (Wehera) nutans*, Schreb. (No. 17, 1855.)

54. *B. Billardieri*, Schw. (No. 44, —11, 34, 1855.)

55. *B. truncorum*, Brid. (No. 15, 31, 52, 160, 174, 175,—27, 1855.)

56. *B. torquescens*, B. et S. (No. 10, 11, 37, 79, 137.)

57. *B. crassinerve*, Hook. fil. et Wils. (No. 53, 1853.)

58. *B. levigatum*, Hook. fil. et Wils. (No. 67, 1855.)

59. *B. duriusculum*, Hook. fil. et Wils. (No. 124, 1854.)

60. *B. balanoides*, Tayl. (No. 134, 179.)

I believe this to be a form of the species known in Europe as *B. atropurpureum*, Web. et Mohr, and of which the oldest name is *B. dichotomum*, Hedw.

6. MNIOIDEÆ.

61. *Fissidens brevifolius*, Hook. fil. et Wils. (No. 17, 32, 130.)

62. *F. tenellus*, Hook. fil. et Wils. (No. 113.)
 63. *F. rigidulus*, Hook. fil. et Wils. (No. 145.)
 64. *F.* (Conomitrium) *Dillenii*, Mont. (No. 30.)
 65. Aulacomnion *Gaudichaudi*. (Leptotheca, Schw. Supp. p. 135. t. 137.
Brachymenium ovatum, Hook. fil. et Wils. in *Fl. Antarct.*)
 Certainly dioicous, as might be supposed from fig. 7 and 8 in the plate above quoted, the synoicous flower probably an accidental mistake. The capsule becomes plicate, as in *A. androgynum*, to which species the present has a close resemblance, but its foliage is of a firmer substance. The internal peristome consists of processes on a rather short base, with the intermediate cilia combined into one, and shorter than the processes, which equal the length of the teeth. No pseudopodia are present amongst these specimens.
 66. *Hymenodon piliferus*, Hook. fil. et Wils. (No. 171.)
 67. *Mnium* (Rhizogonium) *distichum*, Brid. (No. 109.)
 68. *M.* (Rhizogonium) *Hookeri*, C. Mueller. (No. 7, 1855.)
 69. *M.* (Rhizogonium) *Paramattense*, C. Mueller. (No. 7.)
 70. *Leptostomum inclinans*, Brown. (No. 4, 102.)

7. POLYTRICHOIDEÆ.

71. *Polytrichum* (Atrichum) *ligulatum*, sp. nov.; dioicum, caule elongato, foliis longe ligulatis margine crassiusculo duplicato-serrato, nervo lamellis brevissimis dorso spinoso, theca in pedunculo elongato gracili cylindrica erecta parum arcuata, peristomio *A. angustati*.
 HAB. Bornip Creek. (No. 8, 12.) Tarwin. (No. 121.)

Agrees with *P.* (Atrichum) *angustatum*, Hook., in size and general appearance, but its leaves are broader towards their apices, the thickened margin twice as wide, and when dry not involute. The operculum and calyptra are wanting.

72. *P. alpinum*, L. (*P. australpinum*, F. Mueller, MSS.) (No. 105, 135, 1855.)

I have not observed any difference between this and European specimens.

73. *P. juniperinum*, Hedw. (No. 1, 25, 71, 1855. No. 31, 1852.)
 74. *P. commune*, L. (No. 69,—118, 1855.)
 75. *Dawsonia superba*, Grev. (No. 149.)

8. HYPNOIDEÆ.

76. *Hedwigia ciliata*, Hedw. (No. 124, 1855. CC. 1854.)

77. *Crypheia dilatata*, Hook. fil. et Wils. (No. 107, 1855.)

78. *Esenbeckia cuspidata*, Mitten; dioica, caule repente, ramis subsimplicibus flexuosis, foliis patentibus octofariis oblongo-lanceolatis concavis profunde quadriplicatis margine remote denticulatis brevissime binerviatis, perichæcialibus vaginantibus subulato-attenuatis, theca ovali cylindrica basi abrupte in pedicello brevi contracta, operculo conico acuminato, calyptra mitræformi basi inflexa, peristomio dentibus rugulosis processibus solidis æquilongis ciliis rudimentariis interpositis.

HAB. Moreton Bay. August, 1855.

With the same habit and structure as *E. plicata* and *E. elegans* (Endotrichum, *Dry. et Molkenb.*), but its leaves are closely imbricate, not at all flexuose, so that the stems appear terete.

79. *Neckera leptotheca*, sp. nov.; monoica, ramis elongatis inordinatim pinnatis complanatis, foliis e basi minute auriculato-asymmetricis oblongo-lanceolatis obtusiusculis minute serrulatis undulatis brevissime binerviis, perichæcialibus vaginantibus subulato-acuminatis apice dentatis, theca emergente ovali leptoderma, operculo conico-rostrato, peristomio dentibus angustis rugulosis siccitate inter processibus æquilongis hyalinis carinatis solidis nitidis porrectis inflexis.

HAB. Broad Rib River, D. Cabbage-tree River. (No. 93.) Tarwin. (No. 103, 1855.)

Very near to *N. pennata* and to *N. Ehrenbergii*, but differing in the small, pale, thin capsules, which are about half-covered by the perichæcial leaves, when de-operculate they become urceolate.

80. *Phyllogonium elegans*, Hook. fil. et Wils. (No. 110.)

81. *Isothecium molle* (Leskea, *Hedw.*). (No. 101.)

82. *I. ramulosum*, Mitten; dioicum, caule repente, ramis dendroideis arcuatis eleganter bi-tri-pinnatim ramosis, foliis in ramis subdistichæceis, in ramulis undique imbricatis, ovato-oblongis brevi-acuminatis integerrimis concavis nervo furcato solitario v. nervis binis brevibus instructis, e cellulis elongatis angustissimis extremitatibus rotundatis areolatis, perichæcialibus lanceolatis patulis, theca in pedunculo brevi arcuato rubente ovali, operculo conico acuto, peristomio normali *Hypni*.

HAB. Victoria. (No. 170.) Steep-bank River. (No. 53.)

A smaller Moss than *I. arbuscula*, Hook., with more numerous and gradually attenuated ramuli. The capsule is on a longer, arcuate seta, and horizontal.

83. *I. cochlearifolium*. (Hypnum, Schw.) (No. 112.)

This is *H. clandestinum*, Fl. Nov. Zeland., but it corresponds with Schwægrichen's figure; and *Hypnum cochlearifolium*, Fl. Nov. Zeland., seems to be only a larger form of the same Moss.

84. *Leucodon Lagurus*, Hook. (No. 21, 111, 136.)

85. *Pterigophyllum nigellum*, Hook. fil. et Wils. (No. 61, 167.)

86. *Climacium sulcatum*, Brid.

HAB. Brisbane River, 1855.

87. *Hypnum cupressiforme*, Dill., var. *minus*. (No. 2, 38, 51, F.—13, 104, 1855.)

88. *H. Sandwicense*, Hook. (No. 168, 1854.)

89. *H. leptorhynchum*, Brid. (No. 6, 76, 173.)

90. *H. cerviculatum*, Hook. fil. et Wils. (No. 59.)

91. *H. uncinatum*, Hedw. (No. 5, 1855.)

92. *H. homomallum*, Hampe. (No. 6, 40, 41.)

93. *H. auriculatum*, Mont. (*H. chlamytophyllum*, Hook. fil. et Wils.) (No. 122, 1855.)

94. *H. riparium*, Hedw. (No. 110, 1855.)

95. *H. extenuatum*, Brid. (*H. crinitum*, Hook. fil. et Wils.) (No. 9, 125.)

96. *H. paradoxum*, Hook. fil. et Wils. (No. 158, 1855.)

This belongs to the group of species designated by Schimper *Brachythecium*.

97. *H. austrinum*, Hook. fil. et Wils. (No. 15, 1855.)

98. *H. tenuifolium*, Hedw. (*H. confertum*, var. *majus*, Fl. Nov. Zeland.) (No. 43, 53, 58,—97, 1855.)

99. *H. raphidorhynchum*, C. Mueller. (No. 169, 1855.)

100. *H. laxatum*, Mitten; caule repente laxe cæspitoso vage subpinna-
tim ramoso, foliis laxis patentibus ovatis margine superne serrulatis
nervo tenui medio evanescente, e cellulis laxiusculis areolatis, peri-
chætialibus e basi late ovata lanceolatis integerrimis enerviis, theca
in pedunculo brevi suberecta ovali, operculo curvirostrato, peristo-
mio externo dentibus longe subulato-attenuatis.

HAB. Gipps' Land. (No. 115, 120, 1855.)

A yellowish-green Moss, not very much unlike *H. confertum* in size, but its leaves are less acuminate, and composed of cells twice as wide. The teeth of the external peristome have their apices more than usually attenuated.

101. *H. cucullatum*, Mitten; monoicum, caule vage ramoso, foliis

ovatis apice cucullato-inflexis obtusiusculis cymbiformi-concavis margine basi planis ibique cellulis quadratis areolatis, nervo medio evanido, perichætialibus lanceolatis serratis enervibus, theca in pedunculo minute scabro ovali suberecta inclinatave, operculo conico-rostrato, peristomio normali.

HAB. Dargo. (No. 10, 1855.)

Similar to small states of *H. murale*, but its leaves are narrower below the middle, with several rows of quadrate cells at the base on each side of the leaf. The specimens are very poor, but it appears probable that this will be found to belong to the same group as *H. illecebrum* and *H. cæspitosum*.

102. *H. denticulatum*, L.? (No. 59.)

Probably distinct, but too imperfect to be satisfactorily determined.

103. *H. aciculare*, Brid. (No. 60.)

104. *H. comosum*, Labill. (No. 103.)

105. *H. arcuatum*, Hedw. (*H. spininervium*, Hook.) (No. 158, 165.)

106. *H. hastatum*, C. Mueller. (*H. furfurosum*, Fl. Nov. Zeland.) (No. 119,—82 from New Zealand.)

The figure of the leaf in Fl. Nov. Zeland. is taken from those of the ramuli, and very different in form from those of the stem.

9. HYOPTERYGIOIDEÆ.

107. *Cyathophorum pennatum*, Brid. (No. 39.)

108. *Hypopterygium rotulatum*, Brid. (No. 40, 179.)

109. *H. Smithianum*, Hook. fil. et Wils. (No. 169, 1854,—102, 1855.)

110. *H. pallens*. (*Lopidium*, Hook. fil. et Wils.) (No. 157.)

111. *Racopilum cristatum*, Hook. fil. et Wils. (No. 55.)

10. LEUCOBRYOIDEÆ.

112. *Leucobryum candidum*, Hampe. (No. 116.)

III. SPHAGNACEÆ.

113. *Sphagnum cymbifolium*, Dill. (No. 73.)

HEPATICÆ.

1. *Gottschea Lehmanniana*, Nees. (No. 1.)

2. *Plagiochila fasciculata*, Ldbg. (No. 1, 1852,—7, 18, 162, 1854.)

3. *Symphogyna rhizobola*, Nees. (No. 2.)

4. *Fimbriaria Drummondii*, Tayl. (No. 4, 1852,—131, 1855.)
5. *Lophocolea heterophylloidea*, Nees. (No. 5, 56, 78, 92, 96,—99, 1854.)
6. *L. Austrigena*, Hook. fil. et Tayl. (No. 14.) *Jungermannia obtusifolia*, Hook. (No. 143, 144.) *Radula buccinata*, Tayl. (No. 150, 153.) *Frullania falciloba*, Tayl. (No. 176, 177.) *Jungermannia Starckii*, Funk. (No. 198.)
7. *Metzgeria furcata*, Raddi (No. 10, 29, 96, 99,—98, 1855.)
8. *Frullania reptans*, Mitten. (No. 54, 56.)
9. *Polyotus claviger* (Hook.), Gottsche. (No. 84.)
10. *P. Magellanicus*, Gottsche. (No. 111.)
11. *Podomitrium phyllanthus* (Hook.), Mitten. (No. 28, 108.)
12. *Mastigobryum Novæ-Hollandiæ*, Nees. (No. 117.)
Intermixed with *Jungermannia monodon*, Taylor.
13. *Trichocolea tomentella*, var. *pluma*, Nees. (No. 126, 1854.)
14. *Sarcomitrium pingue*, Mitten.
HAB. "*Blasia*, Mount Cobboras."

Description of New Genera and Species of CEYLON PLANTS; by G. H. K. THWAITES, F.L.S., Superintendent of the Royal Gardens at Peradenia. (TABS. VII. and VIII.)

Nov. Gen. I. SCUTINANTHE, *Thw.* Nat. Ord. BURSERACEÆ.

Gen. Char. Flores abortu dioici. *Calyx* cupuliformis, carnosus-coriaceus, in segmentis 5 erectis valvatis ad medium divisus, persistens. *Corolla* cum calyce æquilonga; petalis 5, erectis, valvatis, carnosocoriaceis, persistentibus. *Stamina* 10; *filamentis* in anulum parte inferiori cum disco glanduloso interno et basi calycis corollæque consolidata coherentibus, apice liberis; *antheris* oblongis, introrsis, dorso affixis, longitudinaliter dehiscentibus. *Ovarium* biloculare, loculis bi-ovulatis; *ovulis* collateralibus, axi affixis, amphitropis, foramine supero. *Stylus* brevissimus. *Stigma* disciforme, medio transverse 1-sulcatum, margine crenulato. *Drupa* carnosa, putamine mediocri, osseo, abortu monospermo. *Semen* exalbuminosum, pendulum, inversum; *testa* membranacea; *cotyledonibus* magnis, foliaceis, integris, cordatis, plicato-rugosis, lateribus reflexis; *radicula* parva, cylindrica. *Flores masculi femineique* simillimi; sed in his antheræ effætæ; in

illis ovarium attenuatum, ovulis effectis.—*Arbor ingens, Zeylanica*; foliis *impari-pinnatis, exstipulatis*; petiolo *superne sulcato, basi tumido striato*; inflorescentia *axillari, paniculata*; paniculis *multifloris, bracteatis*.

1. *Scutinanthe brunnea*, Thw. (TAB. VIII. B.)—C.P. No. 1149 in Herbario Peradeniensi.

Arbor 50–60-pedalis, ramulis foliisque junioribus rufo-tomentosis; *foliis* 10–20 poll. longis; *foliolis* 5–11, oblongis, basi parce obliquis, apice acuminatis, integris, penniveniis, viridi-rufescentibus, 4–8 poll. longis (cum petiolulo 4 lin. longo), 2–3 poll. latis, subtus dense reticulatis, venis prominentibus; *paniculis* flavidis rufo-brunneo-tomentosis; *floribus* 3 lin. latis; *drupis* oblongis, rufo-tomentosis, utrinque attenuatis, 1 poll. longis.

This fine forest-tree, which seems to occur only sparingly in the Central Province at an elevation of from 2000 to 3000 feet, bears a considerable general resemblance to some of the *Meliaceæ*, especially to *Amoora* and *Milnea*, but its nearest affinity appears to be with *Canarium*, from which genus however it differs, as the description will show, in many important particulars. I was at first disposed to look upon the petals and stamens of this new genus as perigynous; but on comparing its flowers with those (especially the male flowers) of *Canarium*, it can scarcely be a matter of doubt that the apparent lower portion of the calyx of *Scutinanthe* consists really of a consolidation of that organ with the bases of the corolla and staminal tube, the whole being lined by the glandular disc. The native name of the tree is "*Mahabooloomora-gass*."

PLATE VIII. B. Fig. 1. Flowering branch of *Scutinanthe brunnea*, Thw. (female tree). 2. Flower from same. 3. The same cut open. 4. Vertical section of ovary. 5. Transverse section of same. 6. Unripe fruit. 7. Longitudinal section of ditto. 8. Transverse section of same. 9. A mature embryo, with testa removed. 10. Longitudinal section of male flower. 11. Stamens from the same:—*all but figs. 1, 6, 7, and 8, more or less magnified.*

Nov. Gen. II. GLYPTOPETALUM, Thw. Nat. Ord. CELASTRACEÆ.

Gen. Char. *Calyx* parvus, lobis 4, rotundatis. *Corollæ* petala 4, oblonga, obtusa, superne bifoveolata, margine reflexo. *Stamina* 4; *filamentis* erectis, linearibus, in angulis *disci* insertis; *antherarum*

loculis basi divergentibus, ad apicis latera connectivi maximi innatis, longitudinaliter dehiscentibus. *Ovarium*, una cum disco circumcingente et adhærente, pyramidato-tetragonum, apice ad *stigma* minutum attenuatum, 4-loculare; *ovula* in loculis singula, pendula, anatropa, raphe extrorsa. *Capsula* 4-sperma vel sæpissime abortu 1-3-sperma, rotundata, loculicide dehiscens, valvis revolutis. *Semina* oblonga, pendula, arillo subcarnoso colorato plus minus obtecta; *testa* membranacea. *Embryo* intra albumen carnosum orthotropus; *cotyledonibus* oblongis, planis, foliaceis; *radicula* brevi.—*Arbor mediocris, Zeylanica*; ramulis *tetragonis*; foliis *oppositis, lanceolatis, penniveniis, serratis*; stipularum *rudimentis*; inflorescentia *cymosa, supra-axillari*.

1. *Glyptopetalum Zeylanicum*, Thw. (TAB. VII. B.)—C.P. No. 589 in Herbario Peradeniensi.

Arbor 30-40-pedalis; *foliis* læte-virentibus, $4\frac{1}{2}$ -6 poll. longis, $1\frac{1}{2}$ - $2\frac{1}{2}$ poll. latis, petiolo $\frac{1}{4}$ poll. longo. *Cymarum* pedunculis 1- $1\frac{1}{2}$ poll. longis, pedicellis divaricatis $\frac{1}{2}$ poll. longis; *floribus* albido-virescentibus, 4 lin. latis; *seminibus* $\frac{1}{2}$ poll. longis; *testa* flavo-rufescenti; *arillo* rubro.

This is a well-marked genus, characterized by its peculiar petals, the very large connective to the anthers, the pyramidal form of the combined ovary and glandular disc, and the single pendulous ovule in each locus: its nearest affinity appears to be with *Euonymus*.

HAB. Not uncommon in the Central Province at an elevation of 2000 to 3000 feet.

PLATE VII. B. Fig. 1. Flowering branch of *Glyptopetalum Zeylanicum*, Thw. 2. A flower. 3. Flower with petals removed. 4. Stamen. 5. Longitudinal section of ovary. 6. Transverse section of the same. 7. Immature fruit. 8. Ripe ditto. 9. Section of ripe capsule, showing a perfect seed and an abortive one. 10 and 11. Sections of seed:—all more or less magnified, with the exception of figs. 1 and 8.

Nov. Gen. III. PRISMATOMERIS, Thw. Nat. Ord. RUBIACEÆ;
Tribus *Coffeæ*.

Gen. Char. *Calyx* cupuliformis, margine sinuato vel minute dentato. *Corolla* tubo cylindrico; *limbo* 5-partito, segmentis valvatis lanceolatis, carnosis, prismaticis, basi excavatis. *Stamina* 5, inclusa; *filamentis* brevibus; *antheris* linearibus, dorso prope basin affixis. *Ova-*

rium biloculare, loculis uniovulatis; *ovula* pendula, raphe expansa, introrsa. *Stylus* linearis. *Stigma* lobis 2, divergentibus. *Fructus* carnosus, 2-spermus vel abortu 1-spermus. *Semina* hemisphærica, medio excavata; *testa* membranacea. *Embryo* cylindricus, parvus, in dorso albuminis cornei immersus; *cotyledonibus* minutis; *radicula* versus fructus basin spectante.—*Frutex Zeylanicus*; foliis lanceolatis, penniveniis; inflorescentia terminali, fasciculata; stipulis interpetiolaribus triangularibus, cuspidatis; gemmis gummiferis.

1. *Prismatomeris albidiflora*, Thw. (TAB. VII. A.)—C.P. No. 728 in Herbario Peradeniensi.

Frutex 10–12-pedalis, lævis, ramulis pallidis. *Folia* $2\frac{1}{2}$ –6 poll. longa, $1-2\frac{1}{4}$ poll. lata, petiolo $\frac{1}{2}$ poll. longo. *Fasciculi* 2–4-flori; *floribus* 8 lin. longis, pedicellis 8–10 lin. longis. *Fructus* oblongus, nigro-cærulescens, seminibus 3 lin. diam.

This genus seems to be closely allied to *Ixora*, with which it agrees in habit and general appearance, differing however in its fleshy, prism-shaped, corolla-segments, which are valvate in æstivation, its included stamens, and in the form of its seeds. It is perhaps more nearly allied to *Canthium*. It occurs rather sparingly in the Ambagamowa District of the Central Province.

PLATE VII. A. Fig. 1. Flowering branch of *Prismatomeris albidiflora*, Thw. 2. Corolla laid open. 3. Stamen. 4. Longitudinal section of ovary, etc. 5. Transverse section of same. 6. Ripe fruit. 7 and 8. Ripe seeds. 9. Longitudinal section of same:—all but fig. 1 magnified.

Nov. Gen. IV. DICHILANTHE, Thw. Nat. Ord. CAPRIFOLIACEÆ;*
Tribus *Lonicereæ*.

Gen. Char. *Calyx* tubo elongato, curvato, dimidio inferiore cum ovario connato, superiore libero; limbo 5-partito, segmentis lanceolatis, subæqualibus, reflexis, persistentibus. *Squamulæ* 5, digitatæ vel pectiniformes, calycis tubo paullo intus affixæ, segmentisque alternantes, appressæ. *Corolla* infundibuliformis, calycem multo superans, curvata, bilabiata; labio superiore duobus, inferiore tribus dentibus minutis approximatis terminato. *Stamina* 5, æqualia, inclusa; *filamentis* brevibus, corollæ tubi prope apicem insertis; *antheris* oblongis, dorso prope basin affixis, introrsis, longitudinaliter dehiscen-

* Perhaps referable to *Rubiaceæ*.—ED.

tibus. *Ovarium* biloculare, loculis uniovulatis; *ovula* ex angulo centrali pendula, anatropa, raphe extrorsa. *Stylus* filiformis, curvatus, corollâ fere duplo longior, in disco magno annulari ovarium coronante insertus. *Stigma* subquadratum, obliquum, apice longitudinaliter fissum. *Fructus* ignotus.—*Arbor mediocris, Zeylanica*; ramulis teretibus, ad nodos collari interpetiolari gummiſtuo cinctis; foliis oppositis, lanceolatis, acuminatis, integris, penniveniis, nitidis, reticulatis, petiolatis; petiolo superne convexo; floribus terminalibus, sessilibus, aggregatis.

1. *Dichilanthe Zeylanica*, Thw. (TAB. VIII. A.)—C.P. No. 3422 in Herbario Peradeniensi.

Arbor 30–40-pedalis; foliis viridibus vel sæpiissime viridi-rufescentibus, 3–7 poll. longis, $1\frac{1}{2}$ – $2\frac{1}{2}$ poll. latis; petiolo $\frac{1}{2}$ poll. longo; floribus $1\frac{1}{2}$ poll. longis, flavido-purpureis, sericeis.

This very ornamental forest-tree, which seems to differ considerably from any described genus of the *Lonicereæ*, and which is the only indigenous species of the *Caprifoliaceæ* yet found in Ceylon, with the exception of two species of *Viburnum*, which occur in the more elevated parts of the Central Province, grows in small quantity, at an elevation of about 1000 feet, upon some of the forest-covered hills in the district between Galle and Ratnapoora, where I found it in May last, at which time it was in flower.

PLATE VIII. A. Fig. 1. Flowering branch of *Dichilanthe Zeylanica*, Thw. 2. A flower. 3. Corolla laid open. 4. Stamen. 5. Longitudinal section of calyx and ovary, showing some of the glandular squamulæ at the mouth of the calyx. 6. Transverse section of ovary. 7. Ovule. 8. Stigma:—all more or less magnified, with the exception of fig. 1.

Nov. Gen. V. PALENGA, Thw. Nat. Ord. EUPHORBIACEÆ.

Tribus *Buxææ*.

Gen. Char. Flores dioici.—FL. MAS. *Calyx* sepalis 2, concavis, oppositis. *Corolla* 0. *Stamina* 2, sepalis opposita; filamentis linearibus, erectis; antheris oblongis, extrorsis, longitudinaliter dehiscentibus. *Ovarium* 0.—FL. FÆM. *Calyx* sepalis 4 (2 externis) vel abortu 3. *Corolla* 0. *Stamina* 0. *Ovarium* oblongum, 2-loculare; loculis 2-ovulatis; ovula collateralia, sub placentæ processu magno affixa, anatropa. *Stylus* nullus. *Stigmata* 2, discoidea. *Fructus* oblongus, subcarnosus, putamine crustaceo, abortu monospermo. *Semen* ob-

longum, testa membranacea, hilo laterali, seminis longitudinem fere æquante. *Embryo* in axi albuminis carnosi; *cotyledonibus* oblongis, 7-nerviis; *radicula* cylindrica versus fructus apicem spectante.—*Arbor ingens, Zeylanica*; ramulis *teretibus*; foliis *lævibus, lanceolatis, acuminatis, obliquis, petiolatis, penniveniis, stipulatis, subtus sparsim glanduloso-punctatis*; stipulis *minutis*; floribus *axillaribus, fasciculatis, minutis*.

1. *Palenga Zeylanica*, Thw. (TAB. VII. C.)—C.P. No. 3349 in Herbario Peradeniensi.

Arbor 40–50-pedalis; *foliis* nitidis, nigro-viridibus, 3–5 poll. longis, 1–1½ poll. latis; *petiolo* ruguloso supra sulcato 2 lin. longo; *floribus* albidis ½ lin. longis; *pedicellis* 1 lin. longis; *fructibus* 8 lin. longis, 4 lin. latis, fusco-tomentosis.

The leaf-buds of this species are coated with a gummy secretion; and the young expanded leaves, when immersed in boiling water, become covered with a thin, waxy exudation.

This species has hitherto only been met with in the Ambagamowa District of the Central Province, and there sparingly, at an elevation of about 2000 feet. The native name of the tree is “*Palenga-gass*.”

The nearest affinity of this genus is evidently with *Putranjiva*, which it resembles very much in its foliage, as well as in general appearance. In the simple structure of its male flowers it approaches the *Scepeaceæ*, which group it also resembles, as well as the *Antidesmeæ*, and *Hemicyclia* and *Sphragidia*, amongst the *Buxææ*, in the arrangement of its placenta and ovules, a peculiarity which seems to bring all the above-named plants within the limits of one Natural Order.

PLATE VII. C. Fig. 1, Female flowering branch of *Palenga Zeylanica*, Thw. 2. Young female flower. 3. Vertical section of ovary. 4. Transverse section of ovary. 5. Ripe fruit. 6. Longitudinal section of same. 7. Transverse section of same. 8. Embryo. 9. Male flowers. 10. Male flowers, with sepals removed. 11. Transverse section of male flower:—all but fig. 1 magnified.

Note on the Genus PROSORUS, Dalzell; by G. H. K. THWAITES, Esq.

I find that in my figure and description of “*Prosorius Indica*, Dtlz.,” in the sixth volume of this work, p. 298, tab. 10 C., there are mixed

up two distinct though very closely allied species of this genus, but which the possession of more perfect materials now enables me to define satisfactorily. As regards the foliage of the two species, the slightest difference can scarcely be detected, but the following characters, derived from the flowers, show them to be abundantly distinct :—

1. *Prosurus indica*, Dalz., Hook. Journ. of Bot. vol. iv. p. 345; Thw. *loc. cit.* vol. vi. p. 298. t. 10. *C.* fig. 3, 4, 5, 6, C.P. No. 3099, ♂, No. 2155, ♀, in Herbario Peradeniensi.—*Fl. mas.* numerosissimi, $1\frac{1}{2}$ lin. lati; *disco* convexo, gibbo, ruguloso; *pedicellis* 3–4 lin. longis. *Fl. fœm.* terni; *pedicellis* 4–5 lin. longis.

Not uncommon in the southern and central parts of the Island, at no great elevation.—The native name is “*Carrou-gass.*”

2. *Prosurus Gærtneri*, Thw. *P. indica*, Thw. *loc. cit.* fig. 1, 2, 7, 8, 9, 10. *Croton?* *cyanospermum*, Gærtner, *De Fruct.* vol. ii. p. 120. t. C. 7, C.P. No. 2601 in Herbario Peradeniensi.—*Fl. mas.* numerosi, 3 lin. lati; *disco* concavo, lævi, cum calycis tubo adnato; *pedicellis* 4–5 lin. longis. *Fl. fœm.* solitarii; *pedicellis* 5–8 lin. longis.

This differs from the preceding species in having larger and less numerous flowers and longer pedicels, and in the shape of the glandular disc in the male flowers. It occurs at an elevation of 500 to 1000 feet in the Ambagamowa and Ratnapoora districts.—The native name is “*Sooddoo-leyang-gass.*”

DECADES OF FUNGI; by the REV. M. J. BERKELEY, M.A., F.L.S.

Decades LXI.–LXII.

(With Plates V., VI., IX., X.)

Rio Negro Fungi.

(Continued from p. 241.)

601. *T. prolifera*, n. s.; albus, subrepens, in ramos cylindricos furcatos fasciculatosque abiens, apicibus matrici disco amplo radiato tandem adnatis. Spruce, n. 17.

HAB. On roots of trees.

White, somewhat creeping, forming cylindrical, forked or sometimes flat, stringy threads, here and there subfasciculate, their tips attached again to the matrix by means of large, orbicular, radiated and laciniated discs.

This species resembles in habit and appearance *T. fastidiosa*. The mode in which the tips of the branches are attached is very singular.

* *Cladoderris dendritica*, P., Freyc. Voy. p. 176. Spruce, n. 81.

HAB. On decaying roots of *Alpinia aromatica*. February, 1853. Panuré.

602. *Stereum hydrophorum*, B.; pileo infundibuliformi fusco umbrino zonato processibus longis amplis planis acute laciniatis dense stipatis concoloribus vestito; stipite rigido tenui subtiliter velutino; hymenio albedo. Spruce, n. 80. (Tab. VI.)

HAB. On the ground in high woods on the River Uaupés. Probably attached to concealed branches; also in woods near Rio Negro and Casiquiare. August, 1853.

Pileus 3–4 inches across, infundibuliform, chocolate-brown, coriaceous, repeatedly zoned, velvety, clothed, but more especially in the centre, with a dense forest of flat, branched, acutely lacinated, velvety processes, continuous with the paler substance; edge lobed. Stem $\frac{1}{2}$ –1 inch high, attached by a disciform base, round, nearly even, of the same colour as the pileus, obscurely velvety. Hymenium white or very pale umber, smooth.

Nothing can be more curious than the dense mass of processes with which the centre of the pileus is clothed, which, if torn from it, would certainly be described as a new species of branched *Thelephora*. In age the border has but few processes, and in old specimens they appear to be washed away, in which state the species was originally described from specimens communicated by Sir R. Schomburgk. Ann. of Nat. Hist. vol. xiv. p. 327.

* *S. elegans*, Fr. Ep. p. 545. Spruce, n. 174, 13.

HAB. On trunks of trees. March, 1853. Panuré.

* *S. damacorne*, Fr. Ep. p. 546. Spruce, n. 24.

HAB. On decayed trunks. Panuré.

* *S. reniforme*, Fr. l. c. Spruce, n. 25.

HAB. On the ground.

603. *S. fissum*, n. s.; album; pileo primum spathulato, demum flabellato profunde fisso; stipitibus brevissimis e basi communi membranaceo oriundis; hymenio lævi. Spruce, n. 27.

HAB. On dead twigs. Panuré.

White when recent, ochraceous when dry. Pilei about an inch long, at first spathulate or petaliform, smooth and even or with a few ob-

scure, raised lines, then expanded and flabellate, deeply fissured, nearly to the base. Stems short or obsolete, arising from a common membranous mycelium, which occurs in patches or spreads round the whole branch.

The habit is precisely that of *Cantharellus partitus*, B. No species can be more distinct. Occasionally there is a tendency in the hymenium to become venose, but probably only from contraction in drying.

* *S. lobatum*, Kze. Weig. exs. Spruce, n. 69.

HAB. S. Gabriel, Rio Negro, foot of Mount Cocui.

A very small form.

604. *S. spathulatum*, n. s.; pileo spathulato postice hispidulo, antice glabrescente sublitter lineato; stipite luteo velutino laterali cum pileo confluyente; hymenio pallido subzonato. Spruce, n. 175.

HAB. On wood on the banks of the Rio Negro.

Pileus $\frac{3}{4}$ of an inch long, $\frac{2}{3}$ broad, spathulate or subflabelliform, cuneate below, clothed behind with scattered bristles, which vanish in front, leaving however as their representatives fine raised lines, red-brown, with a pale margin. Stem $\frac{1}{2}$ – $\frac{3}{4}$ of an inch high, yellowish, velvety, hispid above, attached by, a round disc. Hymenium pale, ochraceous, with one or two dark zones, smooth.

Analogous to *Polyporus luteus*, of which it has very much the appearance.

* *Hypolyssus Montagnei*, Berk. Hook. Lond. Journ. vol. i. p. 139. Spruce, n. 70.

HAB. On dead twigs, etc. Panuré.

605. *Guepinia dilatata*, n. s.; ochracea; pileo spathulato-flabelliformi integro extus granulato tomentoso; margine tenui; stipite clongato. Spruce, n. 82. (Tab. X. fig. 4.)

HAB. On wood. Panuré. February, 1853.

Pileus 2 inches across, broadly flabelliform, gradually tapering below into the flat stem, $1\frac{1}{2}$ inch long; margin very thin, not fissured or divided, upper surface clothed with little granular, pubescent dots.

A fine species, approaching in size *Guepinia Helvelloides*, B.

* *G. fissa*, Berk., Ann. of Nat. Hist. vol. x. p. 383.

HAB. On dead wood. Panuré.

* *Auricularia lobata*, Fr. Ep. p. 555. Spruce, n. 12.

HAB. On dead wood. Panuré.

606. *Clavaria delicia*, n. s.; ochracea, caespitosa, delicata; stipitibus

brevibus cylindricis e mycelio candido membranaceo oriundis, ramis furcatis hic illic divergentibus, ultimis acutissimis. Spruce, n. 161.

HAB. On dead leaves and twigs. March, 1853. Panuré.

Ochraceous, about half an inch high, forming delicate, tree-like tufts. Stems short, cylindrical, clothed at the base with a little down, and arising from a white, downy, membranous disc, forked two or three times, some of the branches spreading so as to form little tree-like tufts; ultimate ramuli very acute.

An extremely pretty species, with the habit of *C. flaccida*, but approaching in substance the white-branched *Thelephoræ*, though more transparent. At first sight it has somewhat the appearance of *T. dissecta*, Lév., a very differently constructed species.

* *C. furcellata*, Fr. Ep. p. 576. Spruce, n. 154.

HAB. On the ground. Panuré.

* *C. tubulosa*, Fr. l. c. Spruce, n. 158.

HAB. Panuré.

607. *C. cirrhata*, n. s.; cæspitosa, alba, ramosa; ramis suberectis cylindricis, apicibus rectis curvatisque acutis. (Tab. V. fig. 5.)

HAB. On the ground. Mount Cocui.

Two inches high, ochraceous, white, cæspitose, much branched; branches cylindrical, tips straight or curved.

This was first referred as a variety to *Clavaria furcellata*, but this indication is untenable, and I have therefore described it under a distinct name.

608. *C. dealbata*, n. s.; cæspitosa, alba, opaca; stipite brevi tenui cylindrico sursum 5-6-furcato ramis dilatatis, apicibus subuncinatis acutis. Spruce, n. 159.

HAB. On the ground. March, 1853. Panuré.

White, opaque, 2 inches or more high, cæspitose, fastigate. Stem short, cylindrical; not a line thick, forked five or six times so as to make a tree-like tuft, dilated above, the ultimate divisions somewhat divaricate, the forks below acute, above rounded, ultimate ramuli acute.

A very singular species, remarkable for its white-washed appearance. The branches, except at the extremities, are far broader than the stem, and strongly compressed when dry. Spruce compares this with n. 601, but the two species do not appear to me to have much in common.

609. *C. connata*, n. s.; stipite subelongato e pluribus connato sur-

sum ramoso; ramis hic illic congestis connatisque, apicibus subacutis. Spruce, n. 10.

HAB. On shady ground in woods. Panuré.

Dirty white, 2 inches high. Stem rather long, compounded of many confluent divisions; branches above more free, but here and there dilated and congested, tips rather acute.

This species, on a small scale, has somewhat the habit of *C. macropus*. In all parts however the divisions, instead of being free, have a tendency to coalesce with each other. There is a little white mycelium which binds together the sand.

610. *C. fusco-lilacina*, n. s.; cæspitosa crassiuscula subsimplex fusco-lilacina rugosa, apicibus obtusis. Spruce, n. 152.

HAB. On sandy ground. Panuré.

Tufted, $1\frac{1}{2}$ inch high, rather thick, simple or slightly forked, brownish-lilac, obtuse, rugose, sometimes splitting longitudinally in the middle.

A fine species, remarkable for its lilac tint. It resembles somewhat *Clavaria purpurea*, but is probably tougher when fresh.

* *C. crispula*, Fr. Ep. p. 576. Spruce, n. 160, 162.

HAB. Panuré.

611. *C. Sprucei*, n. s.; alutacea; stipitibus tenuibus glabris à basi contextâ membranaceâ byssoideâ oriundis sursum 3-4-furcatis; ramulis cylindricis substrictis, apicibus obtusis. Spruce, n. 26.

HAB. On decayed trunks and branches. Panuré.

About $1\frac{1}{2}$ inch high, gregarious but not cæspitose, tan-coloured. Stems slender, smooth, springing from a white, membranous, somewhat byssoid expansion, three, or rarely four, times forked; branches erect or only subpatent, cylindrical, tips obtuse.

This resembles somewhat scattered and slightly branched specimens of *Clavaria flaccida*, especially a form of it, which does not grow in pine woods, from which however it is very distinct.

612. *C. Panurensis*, n. s.; aureo-ochracea; stipitibus tenuibus 4-5-furcatis; ramulis erectis hic illic lunatis, ultimis teretibus acutis. Spruce, n. 156.

HAB. On the ground. Panuré.

Bright ochraceous, about 2 inches high. Stems slender, distinct or split almost to the base, forked four or five times; branches erect or only slightly patent, sometimes lunate, ultimate branches elongated, cylindrical, acute, rarely bifid above.

Allied to *C. pratensis* and *muscoïdes*, but clearly distinct from each other, though most resembling the latter. The spores are probably ochraceous, but I cannot say this certainly.

613. *C. scabra*, n. s.; simplex umbrina acuminata pusilla scabra; basi tuberosa, setis erectis strigosâ. Spruce, n. 157.

HAB. On the ground. Panuré.

About $\frac{1}{3}$ of an inch high, gregarious, subcæspitose, pale umber, simple, erect, acuminate, scabrous with little rough granules; base tuberosa, clothed with white or pallid, erect bristles.

This is in many respects like *Calocera tuberosa*, but it appears to be a true *Clavaria*, and is distinguished by its smaller size, scabrous hymenium, and the erect or slightly divergent, not deflexed, bristles at the base.—There is another simple *Clavaria* in the collection, growing on a green substance, which appears to be an anamorphosis of some *Lichen*. The specimens are however too imperfect to afford much information.

* *Esidia protracta*, Lév., Ann. d. Sc. Nat. Oct. 1844, p. 218. Spruce, n. 84.

HAB. On dead wood. Panuré.

* *E. Auricula-Judæ*, Fr. Ep. p. 590. Spruce, n. 18.

HAB. On half-decayed trunks of trees. Panuré.

* *Tremella lutescens*, Fr. Ep. p. 588. Spruce, n. 151.

HAB. On trunks of trees. Panuré.

I cannot distinguish this from pale specimens of *T. lutescens*, such as are figured by Balliard, t. 406, fig. C.

614. *T. fuciformis*, n. s.; alba; cæspitosa, repetiter rotundato-furcata, cum lobis, ultimis exceptis, flabelliformi-dilatata. Spruce, n. 9.

HAB. On trunks of trees. Panuré.

One inch or more high, white, cæspitose, repeatedly lobed or forked, the lobes and main divisions dilated, the base of the forks rounded, the ultimate subdivisions short, cylindrical, obtuse.

Resembling a small specimen of the flabellate and multifid variety of *Chondrus crispus*. It is certainly undescribed.

* *Rhizomorpha corynephora*, Kze. Weig. Exs. Spruce, n. 149.

HAB. Panuré.

It is scarcely necessary to say that this is no autonomous Fungus.

* No. 73 is a curious production on living bark, two or three other forms of which are not unfrequent in South Carolina; they cannot be

Fungi, for their habitat is quite against such a supposition. The probability is that they are anamorphoses of certain Lichens: the truth can probably be ascertained on the spot only where they grow.

* *Cyathus limbatus*, Tul. Ann. d. Sc. 1844. Spruce, n. 148.

HAB. On the half-putrid rhizoma of *Alpinia aromatica*. Panuré. February, 1853.

615. *Scleroderma stellatum*, n. s.; peridio coriaceo demum stellato-reflexo umbrino stellato-verrucoso; sporis umbrino-argillaceis.

HAB. On the ground. Panuré.

About 1 inch across, umber-brown; peridium coriaceous, at length splitting in a stellate manner, rough with minute, stellate warts. Spores argillaceous, tinged with umber, globose, verrucose, $\frac{1}{3500}$ of an inch in diameter.

I know of no *Scleroderma* which at all accords with the present, of which unfortunately only a single specimen was procured.

* *Aschersonia oxyspora*, B., Hook. Journ. vol. vi. p. 205.

HAB. On dead leaves. San Carlos.

Flesh-coloured when fresh. Externally resembling the Khasia specimens. The hymenium is more convolute within, and the spores, instead of $\frac{1}{1666}$, are $\frac{1}{2500}$ of an inch long, differences which are not enough to constitute a distinct species.

616. *Mycogone sphaerospora*, n. s.; strato candido; sporis globosis simplicibus fortiter echinatis. Spruce, n. 96.

HAB. On the gills of some Agaric, in woods near the River Uaupés. March, 1853.

Stratum white. Spores globose, $\frac{1}{1500}$ of an inch in diameter, simple, without any trace of a second articulation, rough with strong, rather obtuse spines.

The Agaric on which this mould is developed is said to be pale, with purple spores, but not a trace of the organs of fructification remain, and the species is altogether indeterminable. The spores of the parasite are a beautiful object under the microscope.

617. *Cordyceps bicephala*, n. s.; stipite elongato gracili brunneo apice furcato pulverulento; clavis ellipticis pulverulentis; sporidiis filiformibus.

HAB. Panuré.

Stem 2 inches high, very slender, curved at the base, brown, forked above, and pulverulent; heads elliptic, pulverulent, even. Asci linear. Sporidia very slender, linear.

This curious species, of which I have seen a single specimen only, is almost intermediate between *Cordyceps* and *Xylaria*, the latter of which it approaches in substance. The clavate tip of the inner membrane of the ascus, and the filiform sporidia, indicate an affinity with the more noble species of *Cordyceps*.

* *Xylaria polymorpha*, P., Syn. p. 7. Spruce, n. 141, 142, 144.

HAB. On dead wood. Panuré.

* *X. hyperythra*, Mont., Ann. d. Sc. Nat. Juin, 1840; suberosa pulvere coffeæcolori undique inspersa rimosula; stipite compresso; clavulâ obtusâ ostiolis nigris notatâ. Spruce, n. 143.

HAB. On decayed trunks. Panuré.

Clothed all over with a coffee-coloured bloom, which in some parts is thick, compact, and cracked. Stems 1 inch high, compressed, confluent. Head rather longer, clavæform, obtuse, cracked longitudinally but not deeply; ostiola black. Sporidia elongated, $\frac{1}{1333} - \frac{1}{2000}$ of an inch long.

This is apparently n. 376, Leprieur, but in a more perfect state than other specimens which I have seen, and brighter-coloured. The sporidia are for the most part twice as long as in that species.

* *X. dealbata*, B. et C., Journ. Ac. Nat. Sc. Phil. vol. ii. p. 284. Spruce, n. 145.

HAB. On decayed trunks. Panuré.

I have only to add to the description quoted above, that the sporidia are $\frac{1}{833}$ of an inch or more in length, larger perhaps than in any other *Xylaria*, except *X. Clavus*, Fr.

* *X. rhopaloides*, Kze. Weig. Exs. Spruce, n. 76.

HAB. On dead trunks of trees. Panuré.

Exactly the same with n. 236, Leprieur.

618. *X. abnormis*, n. s.; pallida, hic illic ostiolis depressis nigris notata cerebriformis subglobosa nodulosa durissima intus concolor; peritheciis pallidis oblongis crassis; ascis gracilibus; sporidiis minutissimis.

HAB. On dead wood. Panuré.

Subglobose, 1 inch or more across, lobed, irregular, nodulose, resembling in appearance a smooth, white truffle, pale, opaque, very hard, tan-coloured, with a rufous tinge when dry; of the same colour within. Stemless, dotted with little discoloured specks indicative of the ostiola; perithecia oblong, with a short neck, thick-walled, consisting of elongated cells; interstices consisting partly of elongated, partly of

globose tissue, hyaline, though appearing black from the abundant uniserial sporidia, which are subelliptic, $\frac{1}{4500}$ of an inch long.

This species is totally different from anything with which I am acquainted. The pale substance, and absence of all carbonization, seem at first to indicate *Hypocrea* rather than *Xylaria* or *Hypoxyton*. The walls of the perithecia are rather thick, perfectly hyaline, and consist of a finely reticulated tissue.

* *X. Clavus*, Fr., Linn. vol. v. p. 543. Spruce, n.

HAB. On dead bark. Panuré. February, 1853.

The spores of this species attain a length of $\frac{1}{500}$ of an inch.

619. *Cordierites Sprucei*, n. s.; cæspitosa, vinoso-nigra; cupulis obliquis infundibuliformibus; extus stipitibusque tenuibus ramosis scabriusculis. Spruce, n. 85. (Tab. X. fig. 5.)

HAB. On decayed trunks. Panuré.

Tufted, vinous-brown, about $\frac{1}{3}$ inch high. Stems slender, scabrous, branched; cups oblique, funnel-shaped, rather rough externally and slightly venose; sporidia elliptic, $\frac{1}{5000}$ of an inch long.

This is nearly allied to *Peziza conrescens*, Schwein., of which I should have considered it a small form, but for the smaller sporidia and smooth hymenium. The latter character however might not hold good with better and more abundant specimens. I have not seen asci in that species, but they are evident enough in the present.

620. *Thamnomycetes fuciformis*, n. s.; stipite crassiusculo filiformi flexuoso, ramulis brevibus rectis thecæformibus regulariter vestito. Spruce, n. 150. (Tab. IX. fig. 3.)

HAB. On decayed trunks. Panuré. February, 1853.

Stem cylindrical, filiform, 1 line thick, flexuous, dark brown, beset everywhere with short, perpendicular branches, about 2 lines long, swelling in the centre, so as to assume the form of the theca of some Moss, and enclosing a single oblongo-elliptic cavity.

This curious species at first sight resembles some seaweed rather than a Fungus.

* *T. rostratus*, Mont., Ann. d. Sc. Nat. Juin, 1840. Spruce, n. 163. Var. *similis*.

HAB. On rotten trunks. Panuré.

Differing in nothing from Dr. Montagne's plant, except in the absence of a beaked ostiolum, a character very variable amongst *Sphaeria*. It is by Dr. Montagne's advice that I refer the specimens to his species.

(To be continued.)

BOTANICAL INFORMATION.

'Flora Vectensis.'

It is with great pleasure we are enabled to announce the appearance, long looked for, of the posthumous work of Dr. Bromfield, the "*Flora Vectensis* : being a Systematic Description of the Phænogamous or Flowering Plants and Ferns indigenous to the Isle of Wight. London : William Pamplin. 1856." One vol. 8vo, 678 pages, with portrait of the Author and an excellent Map of the Island, prepared expressly for this work. A future notice on our part will explain something of the nature of this very important Flora; and we can only at present say that, though limited to the vegetation of a small island, yet that island is so rich itself, and Dr. Bromfield not only devoted so many years to the preparation of the work, but possessed so much talent for careful discrimination and accuracy of description, that it must ever be considered a standard volume in botanical literature, and from which every European botanist may derive information and instruction.

Bunya-Bunya.

The finest cone of *Bunya-Bunya* (*Araucaria Bidwilli*, Hook., in Lond. Journ. of Bot. vol. ii. p. 498, tab. xviii. and xix.) that has perhaps ever been sent to Europe, formed part of the collection of the Australian products in the Exposition Universelle at Paris, 1855, and was exhibited by Chas. F. D. Parkinson, Esq., of Moreton Bay, son of Col. Parkinson. Through the medium of Col. J. Sidney North, M.P., this has been presented to the Museum of the Royal Gardens of Kew,* and it is accompanied by the following interesting particulars, from the pen of Mr. Parkinson himself:—

"This tree is deserving of more notice than any other growing in the northern districts of New South Wales; not perhaps because the quality of the wood may be superior to the other kinds of Pine, but because each tree belongs to some one individual of the Aborigines.

"The *Bunya-Bunya* is of the Pine kind, and grows in scrubs, or

* These Gardens, as is well known, possess the first and original tree of this fine *Araucaria*, to which the above name was assigned; and it is now one of the most striking and ornamental trees in the collection, requiring however protection during the winter months.

ranges of hills or mountains. It is not known growing in a wild state further to the south than the range dividing the falls of the waters of the rivers Brisbane and Burnett; but in the Wide Bay District, in the twenty-seventh parallel, it grows very thickly over an extent of country, about thirty miles by twelve, which is in consequence called the '*Bunya-Bunya* country.'

"The tree is easily distinguished, as it far outtops every other kind of tree in the scrub; and instead of the branches pointing downwards as in the Moreton Bay Pine (*Araucaria Cunninghami*), they grow straight out from the tree, or rather with a curve or inclination upwards.

"Its height is immense; Leichhardt mentions their being 160 feet high before there were any branches, for in its wild state the branches only grow near the top of the tree, owing to the want of light in the scrub, but if planted out in an open space they feather quite to the ground.

"The wood can be used for the same purposes as Pine, and is rather more durable: it makes excellent sheep-hurdles. The leaves are of a rich dark green, and sharp-pointed, so much so as to be prickly. The cone, or fruit, is very large, and grows on the extreme tip of the tree. This fruit is only plentiful every third year. In appearance it is like an immense Fir cone, and is, before it is quite ripe, of a beautiful green colour. Measurement of the cone sent to the great French Exhibition:—12 inches in length; 22 inches round the broadest part, transversely; 19½ round in the narrowest part. The shape is a depressed globe.

"When the proper season arrives, the natives assemble in great numbers from very great distances all around, for the purpose of eating the fruit, which they generally roast. Each tribe has its own peculiar set of trees, and each family its own allotment among them. These are handed down from generation to generation with the greatest exactness, and if any one is found in a tree not belonging to him, a fight, or 'pullen pullen,' is the inevitable consequence.

"This is believed to be the only hereditary personal property possessed by the Aborigines, and it is therefore generally respected, and this makes the '*Bunya-Bunya*' interesting.

"C. F. D. PARKINSON."

Mexican Botany.

The following is an extract from a Letter of our valued and very obliging friend Henry Christy, Esq., dated Mexico, March 27, 1856.

"I wrote you very hurriedly from Havana on the 6th, and by the same mail you would receive some seeds, etc. I have now been a fortnight in this wonderful country, wonderful alike in its geological as well as its vegetable features. I hope to do something for you among the medicinal plants, some of which are very curious and little known, having had the good fortune to fall in with some of the collectors for the druggists, and also to possess sundry notes of inquiry from my indefatigable cousin, Mr. Hanbury. Should you wish any collection of Mexican plants, there is a German gentleman, a Mr. W. Schaffner,* a druggist, residing at Orizaba, who could do anything in that way. He has already collections for disposal, comprising some 400 Ferns and Lycopodiums, 300 Grasses, etc., and 600 Composite plants. A Mr. Pitts has applied himself to *Cacti*, and has, I hear, a first-rate collection. He might, though not a regular collector, be inclined to make exchanges. Mr. Schaffner would like to make a general collection, and thinks it would take four to five years to go over all this difficult and wide-spread country. Through a druggist here, an Italian of great intelligence, and in relation with all the drug-collectors, a Señor José del Pozzo, any inquiry about any particular medicinal plant could be best made. There are many collectors of Orchids, both in the 'Tierra Templada' as well as the 'Tierra Caliente,' but, so far as I hear, they have chiefly gone to Germany. In the Orchid-house at the princely villa of Don Manuel Escandon, at Tacubaya, the Richmond of Mexico, I saw some very beautiful ones, which Mr. Lettsom, our Chargé d'Affaires, says are new. I am now a beggar for him for some seeds, and I shall be very glad if it is in your power to send them to him, through the Foreign Office, next mail, addressed 'W. G. Lettsom, Esq., H.B.M. Chargé d'Affaires, Mexico.' He wants *Victoria regia* and *Nelumbium cœruleum*. The vegetation here is extraordinary,—most of our fruits, vegetables, and common weeds, mixed with those of a semi-tropical character. Wheat-culture ceases on the mountains between here and Toluca, 9000 feet elevation; the Banana between Cadiva

* From this gentleman we have lately received a very interesting and well preserved Herbarium.—Ed.

and Orizaba, at 2700; wheat commences at Aculcingo, 2900 feet, in the valleys in the eastern slope, where, from the frequent rain, they can have two or more crops. On the wheat-growing plains of the plateau, commencing with the Cañadas of Istapa, 4000 feet, owing to the long drought and but one wet season, only one crop is got; it is sown in June, and reaped in September; the rainy season commences there in June, and extends partially till October. Maize is left out, as in the States, till November, to get dried by the frosts. At Mexico the temperature I find pretty steady to 48° to 50° at sunrise, and 70° to 75° in the shade during the day. The barometers are graduated, not as ours, from 28 to 31, but from 21 and 24; the variation is generally trifling, it is now $22\frac{9}{10}$; water boils at 199° . I hope to get the fall of June from the *Minerea*, the only scientific government offices. The country is in a state bordering on anarchy, and our excursions are much limited. We arrived in the night of a rather severe revolution, which is now, it is hoped, subdued; Puebla, the second city, with 70,000 people, having surrendered. Mexico is still strongly barricaded, as it was feared the rebels would march on the capital. I am now starting for the Real del Monte Mines. The country is said to be very beautiful, and the elevation 1500 feet above Mexico; the climate is like England, so much so that at the table of the Company, I am told by the Hon. Mr. Pakenham, nothing but port-wine is drunk. I go under the wing of two families, who think it best to have an escort of thirty-five men, but I believe that there is no real danger.—H. C.”

COLLECTIONS OF PLANTS *on Sale with* Mr. R. F. Hohenaker,
Esslingen, near Stuttgart.

1. Prof. Blytt, Pl. *Norvegiæ rariores*. Sp. 20–100. 3s. 5d.—17s. 2d.
2. Dr. Lindeberg, Pl. *Alpium Norvegiæ rariores*. Sp. 200. £2.
3. Huet du Pavillon, Pl. *Siciliæ*. Sp. 300. £2. 18s. 4d.
4. Becker, Pl. *rariores Desertorum Wolgæ Inferioris*. Sp. 150. £1. 16s.
5. Lechler, Pl. *Peruanæ*. Sp. 60–250. £1.—£4. 3s. 7d. For a Catalogue of this collection, cfr. ‘*Berliner Bot. Zeitung*,’ 1856, 390; *Flora*, 1856, 271.
6. Schimper, Pl. *Abyssinicae e territorio Agow*. Sp. 170–200.

£2. 6s. 8d.—£2. 14s. 10d. From a part of Abyssinia, which was hitherto unexplored, and of a character quite different from those known already. Almost all the species have not yet been distributed in Mr. Schimper's collections. A catalogue of them will be found in the German botanical gazettes.

Araucaria imbricata.

Hitherto we believe the original tree of the Chili Pine, introduced by Mr. Menzies from the Voyage of Captain Vancouver, in Kew Gardens, is the only one that has produced cones in this country. We saw a fine cone at Paris last year. Our valued friend, the Very Rev. the Dean of Winchester, informs us that his beautiful tree at Bishop's Stoke, thirty years old and twenty feet high, is now bearing a cone from one of the topmost branches; and further that, at Bickton, the seat of Lady Rolle, one tree is showing cones and another female flowers.

NOTICES OF BOOKS.

MOORE, THOMAS, F.L.S.: *The FERNS of Great Britain and Ireland.* Edited by DR. JOHN LINDLEY, Ph.D., F.R.S., etc. Parts XIII.—XVII. (the conclusion). Imp. folio. Nature-printed by Henry Bradbury. London, 1855–6.

It is not one of the least of the merits of this remarkable work, that it has appeared from the press of the spirited publisher, Mr. Bradbury, monthly, with the greatest regularity, and is now brought to a conclusion with the seventeenth number; embracing, not indeed all that are called *Ferns* in the ordinary acceptance of the term, but the true *Polypodiaceæ* and *Hymenophyllaceæ* (or *Trichomanideæ*), which some authors entirely exclude from the Filices veræ, *Osmundaceæ* and *Ophioglossaceæ*; omitting *Lycopodiaceæ*, *Equisetaceæ*, and *Marsileaceæ*;—which too, it must be confessed, are not well suited to this style of nature-printing.

The 13th Fasciculus of this remarkable work opens with a Plate

(XXXVIII.), well stored with eight figures, representing so many variations in form (of greater or less degree) of *Asplenium marinum*; and nine varieties are recorded. Plate XXXIX. exhibits the well-known *Asplenium Trichomanes*, and certain forms, of which latter nine are here (as in the preceding species) enumerated, accompanied by the remark, "until lately very little variation had been observed in this species; now however several marked varieties are known, and they, for the most part, seem to have the quality of constancy;"—we hope our author does not mean to that degree as to merit being considered distinct species. We have been lately favoured with some specimens of the seventh so-called variety, "from the banks of the Wye, near Monmouth, by Mr. J. D. Enys," *inæquale*: but we must honestly confess we should reckon such to be almost the normal form of the species; so different are the opinions of botanists on Ferns, which every one has the opportunity of studying on our walls and rocks. Plate XL. *Asplenium viride*.

Part XIV. The first Plate here, VII.*, represents the *Polypodium alpestre*, as yet, in Britain, found only on certain highland mountains in Forfar, Aberdeen, and Perthshire. We are glad Mr. Moore abandons his former views of considering *P. flexile* a distinct species, and that he unites it with *P. alpestre*. Plate XLI. includes three somewhat allied species:—viz. 1, our Wall Rue, the well-known *Asplenium Ruta-muraria*; 2, *Asplenium Germanicum*, a very rare inhabitant of the North of England and of Scotland; and 3, *Asplenium septentrionale*, also a rare British plant. Plate XLII. represents *Scolopendrium vulgare*, and its varieties, or rather deformities, to the illustration of which ten folio pages are devoted, and sixty-six varieties are discriminated.

Part XV. Plate XLIII. *A.* exhibits the *Ceterach officinarum*, or "Scale-Fern;" but the figure would hardly justify this latter name:—this process of Nature-printing quite failing in representing the hairs and scales of plants. The thick, woody, and knotted rhizome of this and other Ferns is equally unsuited to this art. At letter *B* of the same plate, the rare *Gymnogramma leptophylla*, being a thin, delicate plant, is most faithfully figured, as is *Blechnum Spicant* (letter *C*), with the exception of the root. Although only the usual form is given, thirteen varieties are described. Plate XLIV. *Pteris aquilina*. Plate XLV. *Adiantum Capillus-Veneris*.

Part XVI. Plate XLVI. represents very good figures of *Cystopteris*

fragilis, *regia*, and *montana* (*alpina* of most authors). Plate XLVII. *Woodsia Ilvensis** and *W. alpina* (*hyperborea* of most authors). These respective figures are so extremely like each other as scarcely to justify Mr. Moore's remark, "No species, one would think, need be more distinct than *W. alpina* is from *Woodsia Ilvensis*." Not a few able botanists find it hard to distinguish them, and it is certain that the extreme forms are not here represented. Deprived of the copious chaffy scales, or exhibiting them only as a faint blur in "nature-printing," the configuration of the two species seems to be identical. Plate XLVIII. *Trichomanes radicans*. These are noble specimens, but apparently entirely destitute of fructification, or if the samples, affording the specimens impressed, possessed it, it is quite obsolete in the figures.

Part XVII. Plate XLIX. *Hymenophyllum Tunbridgense* and *Hymenophyllum unilaterale* (*Wilsoni*, Hook.). Here again we find nature-printing at fault. Distinct as we believe these two species assuredly to be, the figures by no means exhibit the differences. This is in part due to the principal character being microscopic (the entire valves of the involucre); in part also to a peculiar curvature of the apex and pinnæ, in the living plant, admirably described by Mr. Wilson, and as admirably figured by Sowerby in E. Bot. Suppl. t. 2636, but lost in the pressure and flattening of the specimens.

Plate L. *Osmunda regalis*. Plate LI. *Botrychium Lunaria*, *Ophioglossum vulgatum*, and *O. Lusitanicum*; which latter Mr. Moore observes may "fairly be allowed to remain separate from *O. vulgatum*." The author takes no notice of its being already in the late (seventh) edition of the 'British Flora,' considered a mere var. β of *O. vulgatum*, and that not till after a careful examination of the numerous specimens in the Hookerian Herbarium, where "we find all intermediate gradations from the largest and broadest cordate or ovate sterile fronds to a narrow, linear-lanceolate form not half an inch long." Mr. Moore has also carefully examined the same specimens and recorded many of the numerous localities, but comes to an opposite conclusion in regard to

* Custom and want of consideration of the origin of this specific name has permitted its continuance, but *rufidula* (Sw. and Willd.) is infinitely to be preferred. Linnaeus called the plant *Acrostichum Ilvense*, believing it to be a plant of Dale-champ, his *Lonchitis aspera Ilvensis* (Ilva, island of Elba!). The geographical and climatic distribution of plants was not much studied in Linnaeus's days, or his habitat, given in the 'Species Plantarum,' "in Europæ frigidissime rupibus," would have thrown a doubt on the identity of the two plants.

specific limits or extension.—The author's Preface is chiefly occupied by an apology or explanation of his "*multitudinous variations*" of the comparatively few species of Ferns inhabiting these islands:—"It will be apparent from the subordinate position assigned to them, that no botanical importance is claimed for most of the forms thus enumerated." Not in general we are satisfied, in Mr. Moore's own view, but it is not so with less instructed minds; and we have ourselves, since the publication of this noble work, received not a few specimens of these variations from young botanists, on which they have laid great stress, but which are totally unworthy any marked attention; and Mr. Moore himself in many instances seems to regret that some of these are not more honoured by botanists in general.

We have however to thank Mr. Bradbury heartily for a work of great beauty and of great artistic interest, and Mr. Moore for the knowledge and care and attention he has devoted to the scientific descriptions and history. We have reason to believe the publication has met with great success, and that it will ere long be found in every library that deserves the name of "botanical."

SCHOTT, H.; ANALECTA BOTANICA: *adjutoribus* C. F. Nyman et Th. Kotschy. Part I. 8vo. Vindobonæ, 1854.

This little work contains specific characters, often accompanied by more or less extended remarks, on rather more than one hundred South Austrian or Oriental plants, the greater part of them new species of the authors. How far the plants may be considered deserving to rank as species, we have no means of judging: but that the authors differ in their views from botanists in general, may perhaps be inferred by their motto, from Schmiedel, "*Cum satis constet, modestum dissensum neque veritati neque scientiis unquam nocuisse; nemini molestum erit, si ea declaramus, quæ nobis magis probantur, quantumvis ab aliorum placitis recedunt.*" The characters and notes seem to be carefully drawn up, and probably from living plants in cultivation, though it is not expressly stated that they are so.



Species Plantarum Maderensium quædam Novæ, vel hactenus ineditæ, breviter descriptæ; auctore R. T. LOWE, A.M.

1. *Berberis Maderensis*, Lowe.—*B. fruticosa* spinis tripartitis, foliis simplicibus subspathulatis oblongo-lanceolatis obtusiusculis basi attenuatis subcoriaceis rigidulis reticulatis submarginatis integerrimis, ramulis aurantiacis costatis v. striatis, racemis erecto-patentibus abbreviatis subpaucifloris, floribus globosis.

HAB. In rupibus excelsis convallium Maderæ, ad altitudinem 5000 ped., rariss.

This, the only indigenous Madeiran Barberry, most resembles *B. Cretica*, L., which may however be at once distinguished by its low, dwarfish, stunted, densely prickly habit, thick, short branches, and small leaves.

I revert to my original name of *B. Maderensis* for this plant, discovered by me first in 1838; that of *B. lycioides*, by which I have more lately for some years spoken of it, trenching too closely upon *B. Lycium* of Royle.

2. *Cheiranthus arbuscula*, Lowe.—*C. fruticosus* pygmæus dumosus foliosus, caule erecto nano apice capitato-ramoso, ramis abbreviatis plerumque congesto-glomeratis, foliis linearibus apicem versus subdilatatis acutis integerrimis incanis scabris adpresse strigosis, floribus lilacinis, siliquis strictis arcte erectis.

HAB. Abundanter in rupibus montium Pico Branco et P. de Conselho, Portûs Sancti.

Preserves, when cultivated in England, its peculiar, low, stunted habit. Flowers and pods large.

This is the plant erroneously referred to under the name of *Cheiranthus tenuifolius*, Hérît., in '*Primitiæ Faunæ et Floræ Maderæ et Portûs Sancti*,' p. 57, as the favourite haunt of *Helix cheiranthicola*, Lowe. The true *C. tenuifolius*, Hérît., is a perfectly distinct Madeiran species, not found at all in Porto Santo, and very rare or local even in Madeira.

3. *Spergularia fallax*, Lowe.—*S. glabra*, foliis lineari-subulatis fasciculato-verticillatis muticis obtusis subteretibus basin versus supra planiusculis subcanaliculatis, pedicellis defloratis refractis, sepalis angusto-lanceolatis dorso late herbaceo-viridibus margine albo-scarioso, petalis lanceolatis calycem æquantibus, seminibus globoso-len-

ticularibus seriatim punctatis nitidis atris ala membranacea dilatata radiato-plicata alba cinctis.

HAB. In maritimis Maderæ, Portûs Sancti, Insulæque Desertæ Septentrionalis et Australis.

Facies *Spergula arvensis*, L.; sed præter stylos semper tres, capsulam constantissime trivalvem, seminaque late alato-marginata, floribus 6-7-andris fructuque minoribus, sepalis angustioribus, pedicellisque nec pubescentibus nec glandulosis differt.

In several of the characters above enumerated, and smaller size, this much confused or overlooked, and perhaps still questionable species, agrees better with *Spergula pentandra*, L., than with *S. arvensis*, L.; judging of the former not uncontroverted plant by one of Löffling's original specimens (see Smith's E. Flora, ii. 338) preserved in the Banksian Herbarium. It has been sent however under both these names by Bourgeau to Europe. The Banksian Herbarium, for example, contains,—

(1). One whole sheet of Canarian specimens of *Spergularia fallax*, from Bourgeau, labelled "Pl. Canarienses, No. 334, *Spergula arvensis*, L. (Phytogr. Canar. i. 146), Teneriffa, Laguna, 28 Jan. 1845."

(2). Another sheet from the same botanist, marked "Pl. Canar. No. 410, *Spergula pentandra*, L. (Phytogr. Canar. i. 145), Teneriffa, Mesa de Mota, Jan. 1849," is composed of two unquestionable specimens of *Lepigonum fallax*, and two others of a totally different plant, viz. *Spergularia rubra* (*Arenaria rubra*, var. *a*, L.; *Alsine rubra*, Wahlenb.); a confusion the more singular, because this latter plant has been also sent by Bourgeau to the Banksian Herbarium, correctly named, on another sheet, labelled "Pl. Canar. No. 302, *Alsine rubra*, Wahlenb. (Phytogr. Canar. i. 148), Lancerotta, prope opp. Teguisse, 1845."

(3). A third sheet, marked "*Spergula pentandra*, L.," contains, in addition to six small specimens from "Hispania, C. G. Ortega, M.D., 1777," of perhaps true *Spergula pentandra*, having at least a distinctly five-valved capsule,—another undoubted specimen of *Spergularia fallax*, found "In Insulis Canariensibus, Webb."

Thus the plant appears to be diffused throughout the whole Macaronesian archipelago; though hitherto confounded with one or the other of the above old-established species. It differs however from both in its three styles, three-valved capsule, and six to seven stamens; thus belonging to *Spergularia*, Pers. (*Lepigonum*, Fr., Wahlb.; *Alsine*,

Wahlenb.), instead of *Spergula*. In Madeira at least, these and other characters constantly distinguish it from the common *Spergula arvensis*, L.

4. *Anthyllis Lemanniana*, Lowe.—A. caulibus diffusis decumbentibusve adpresse sericeis basi suffrutescentibus, foliis impari-pinnatis, foliolis subdenis elliptico-oblongis subtus sericeo-pilosis inæqualibus infimis minoribus terminali intermediis haud majore, capitulis sæpe duplicatis bracteatis, bracteis ligulatis, calycibus pilosissimis subinflatis oblongis pallide citrinis, corollis lacteis vix subcarneis marcescentibus citrinis apice atro-sanguineis, legumine semiovali monospermo.

HAB. Rariss. in rupibus excelsioribus cacuminibusve Madaræ.

A very distinct and lovely species, with delicate, cream-coloured or pale blush-pink, dark crimson-tipped flowers. Its name is a tribute to the memory of the late Charles Lemann, M.D., an able and accomplished botanist, whose early loss to science has been only through his own peculiar diffidence of character less widely known to be more deeply felt in the circle of his more immediate friends. Having spent the greater portion of the years 1836 and 1837 in Madeira, he had subsequently devoted much time, at my request, to the investigation of various doubtful points connected with its flora; and the present elegant addition to the species of *Anthyllis*, although first discovered by another late regretted friend, P. B. Webb, Esq., of Canarian celebrity, in 1828, was first obtained in imperfect flower by Dr. Charles Lemann in July, 1837, and formed a frequent subject of discussion in our correspondence afterwards. Sufficient materials were still however wanting to establish perfectly the species till I rediscovered it in 1847, and subsequently for several successive years, in favourable condition for complete investigation.

5. *Medicago calcar*, Lowe.—M. piloso-pubescens subvillosa, caulibus prostratis elongatis gracilibus tenuibus rigidulis, stipulis lanceolatis parce et subremote fimbriato-laceris v. setaceo-incisis, foliolis obovatis apice argute serratis inferioribus retusis, pedunculis 1-5- (plerumque 2-3-) floris folia subsuperantibus v. æquantibus, leguminibus glaberrimis cochleatis 3-4-cyclis subinermibus vel biserialiter parce breviterque calcaratis oblique subvenosis nec reticulatis nec lacunosis.

Var. *α*; pedunculis folia subsuperantibus, leguminibus rugulosis marginis spinis rectis conico-abbreviatis armato.

Var. β ; pedunculis folio subæquantibus, leguminibus lævibus inermibus vel subinermibus.

HAB. In Portûs Sancti apricis.

I first discovered this plant in 1828, but remained unable to establish its claims to specific distinction till last year (April, May, 1855), when I again met with it in two or three localities plentifully, during a month's thorough re-examination of the whole island, in company with Mr. Wollaston. It has been sent by Bourgeau from Grand Canaria to the Banksian Herbarium (Pl. Canar. No. 768), labelled "*M. tribuloides*, Desrouss." It is very distinct from *M. tribuloides*, Lam., and appears to be hitherto undescribed.

6. *Melilotus Lippoldiana*, Lowe.—*M.* caule erecto, foliolis rotundato-obovatis suborbicularibus abbreviato-cuneatis latiusculis, summis angustioribus oblongo-obovatis, argute erosulo-denticulatis, stipulis angustis lineari-acuminatis setaceo-productis, floribus majusculis laxè racemosis distincte pedicellatis, corolla calycem duplo excedente, carina vexillum æquante, alis brevioribus, calyce subbilabiato dentibus duobus superioribus approximatis, leguminibus ovatis rostratis carinato-marginatis subconfertim flexuose arcuato-costatis v. subcorrugato-plicatis.

HAB. In Maderæ apricis maritimis.

An old, imperfect specimen of this plant exists in the Banksian Herbarium, ticketed by Dr. Solander, "*Trifolium Melilotus italica*, Linn. Sp. Pl. 1078, Madera." It is however perfectly distinct from the plant to which that synonym is usually considered to belong; and *M. parviflora*, Desf., is the species to which it more approximates; from this however it is easily distinguished by the rounded, broad or shortly ovate leaflets, the more lax racemes, the larger and distinctly stalked, instead of nearly sessile flowers, and the keeled or margined, beaked, and ovate, somewhat densely arcuato-plicate pods. The name commemorates a German horticultural botanist, Dr. Lippold, who resided a year or two in Madeira nearly twenty years ago, and who first called my attention more particularly to this plant, as differing more than varietally from the common *M. parviflora* and *sulcata*, Desf.

Ord. LEGUMINOSÆ.

TRIB. LOTEÆ.

Gen. PEDROSIA, Lowe.—*Calyx* campanulatus, quinquefidus, laciniis

tubo longioribus. *Corolla* carina rostrata vexillum alasque excedente. *Stamina* diadelphea, $\frac{1}{2}$. *Stigma* capitatum; *stylus* rectus, *subtus dente subulato producto fissus*. *Legumen* lomentaceum, lineare, rectum, cylindraceum, *isthmis sæpissime strangulato-moniliforme torulosum, septis inter semina transversis pluriloculare*.—Plantæ *plerumque maritimæ* Macaronesianæ sc. Maderenses aut Canarienses, *prostrato-fruticulosæ, humiles, microphyllæ, argenteæ v. glaucescentes*; floribus *citrinis luteis aurantiacisve sæpe atro-purpurascensibus*.—Nomen ferat in honorem J. A. Pedroso, Insulam Portum Sanctum plantis plurimis foris introductis tam usu quam ornatu præstantibus (e. g. *Tamarix anglica*? Webb, et *Mesembryanthemum edule*, L.) locupletantis, a suis æque ac ab alienis botanophilis ob egregiam humanitatem plantarumque studiositatem optime merentis.

* *Flores solitarii, axillares.*

7. *Pedrosia Porto-sanctana*, Lowe.—P. sericeo-argentea suffrutescens, caulibus diffuso-prostratis v. humifusis adscendentibus, stipulis foliolisque lineari-lanceolatis, floribus solitariis axillaribus sessilibus, calycibus amplis persistentibus villosis, leguminibus calyce vix longioribus villosis tereti-moniliformibus articulis globosis.

HAB. In rupestribus maritimis Portûs Sancti vulgatiss.

Flores inter folia latentes subinconspicui sat vero magni atro-purpurei sc. carina citrino-virescente alis vexilloque nigris. *Legumina* parva, 2–6-sperma, calyce fere inclusa.

Discovered first in 1828, but omitted in my 'Primitiæ' and 'Novitiæ,' from uncertainty regarding some of its essential characters.

8. *Pedrosia argentea*, Lowe.—P. sericeo-argentea hirsuta, caulibus diffuso-prostratis elongatis adscendentibus rigidis lignosis frutescentibus, stipulis breviter petiolulatis foliolis ovali-rotundatis, foliis petiolatis foliolis obcordato- v. obovato-cuneatis retusis nervo sæpe excurrente mucronulatis, floribus solitariis (rarissime binis) subsessilibus, leguminibus distincte pedicellatis longis rectis cylindricis hirsuto-subpuberulis 12–50-spermis.

HAB. In cacumine montis Pico de Facho Portûs Sancti, et in Insulis Desertis.

Differs strikingly from *Pedrosia macrantha* (*Lotus macranthus*, Novit. 546) in its much larger leaflets, clothed like the whole plant with long, close, silky hairs, and in its stouter, more robust, and woody habit.

Flowers dark lurid-purple. Pods 1-2 inches long, as many-celled as seeded.

** *Flores subumbellati.*

9. *Pedrosia florida*, Lowe.—*P. fruticulosa* sericeo-albicans foliolosa, foliolis confertis parvulis lanceolatis v. obovato-lanceolatis acutis stipulisque conformibus omnino sessilibus, umbellis 2-5-floris, leguminibus rectis cylindricis glabris.

Var. α ; fl. læte aurantiacis.

Var. β ; fl. pallide sulphureo-stramineis.

HAB. In Portu Sancto.

Differs from *P. (Lotus) glauca*, Ait., in its more silky, hoary foliage, lanceolate acute leaflets, larger, more numerous flowers, often four or five in a head, and larger, thicker, straighter, and even, instead of stragulate-torulose, pods.

10. *Astragalus Solandri*, Lowe.—*A. herbacea* annua villosa-pubescentibus, caulibus prostrato-ascendentibus diffusis, foliolis multijugis ovalibus v. oblongo-ellipticis retusiusculis superne glabris inferne hirsutis canescentibus, pedunculis elongatis folio longioribus multifloris, pedicellis fructiferis deflexis, leguminibus pendulis falcatis compressis dorso late canaliculatis acutis adpresse strigoso-pubescentibus.

Astragalus canescens, Sol. MSS. in Herbar. Banks. nec DC.

HAB. In Portu Sancto vulgatissimus.

The compressed, trigonal, widely channelled, and in all stages adpresso-pubescent pods, not to mention other points of difference, seem to distinguish this common, and certainly indigenous Porto-Santan *Astragalus*, from *A. hamosus*, L., and I therefore yield at length to the great authority of Dr. Solander, who, as I ascertained more than twenty-five years ago, had made it a distinct species. From *A. falciformis* v. *falcatus*, Desf., on the other hand, it differs in its hairiness and annual root, though resembling that species greatly in the pods and general habit.

Although in strictness Dr. Solander's MS. designation of this plant is not superseded by *A. canescens* of De Candolle, that species having merged into a synonym of *A. onobrychoides*, Bieb., it would be now undesirable to adopt a name having no real claim to preference, and liable to cause confusion.

Ord. UMBELLIFERÆ.

SUBORD. ORTHOSPERMEÆ.

** *Umbellis compositis seu perfectis; vittis in fructu variis, rarissime nullis.*—
DC. Prodr. iv. 57.

†† *MULTIJUGATÆ, nempe jugis primariis et secundariis notatæ.*—Ib. 58, 199.

TRIB. THAPSIÆ, *Ib.* 58, 202.

Gen. MONIZIA, *Lowe.*—*Flores* . . . *Fructus* a dorso plano-compressus, 14-costatus, costis (præsertim 4 lateralibus marginalibus) crassis fungoso-suberosis obtusis rotundatis inermibus, 10 dorsalibus (intermediis) minoribus, 4 lateralibus (marginantibus) magnis. *Mericaipia* jugis primariis 5, 3 intermediis crassiusculis subfungoso-suberosis dorso, 2 lateralibus v. potius ventralibus tenuibus (vix filiformibus) simplicibus nec fungosis plano commissurali impositis; secundariis 4 fungoso-suberosis crassis obtusis, 2 interioribus minoribus tenuiusculis, 2 exterioribus marginantibus maximis latis obtusissimis; vittis sub jugis secundariis 4 dorsalibus, 2 commissuralibus latissimis; carpophoro bipartito. *Semen* complanatum.—*Herba* basi frutescens, caudice simplici abbreviato obeso crasso lignoso subarboreo, caule florifero annuo terminali erecto-ramoso, foliis æqualiter et concinne decomposito-pinnatisectis, segmentis rigidiusculis lucidis glabris, petiolis late vaginantibus velutinis. *Umbellæ* compositæ multiradiatæ, bracteis bracteolisque (involucris involucellisque) polyphyllis integris. *Flores* albi.

Named after Senhor J. M. Moniz, an ardent botanist and successful investigator of the native Flora of Madeira, and a no less zealous horticulturist, always actively engaged in introducing new or rare plants into the island, and in promoting the spread of agricultural and horticultural knowledge amongst his countrymen.

11. *Monizia edulis*, *Lowe.*

HAB. In rupibus excelsis maritimis Insulæ Desertæ Magnæ.

This fine Umbelliferous plant, remarkable for its large and elegant, varnished, fern-like foliage, approaches nearest to *Melanoselinum decipiens*, Hoffm., of Madeira, both in botanical characters and habit. The woody stem is however much shorter, thicker, and obese, instead of tall and cylindric, and the finely-divided foliage is very different and peculiar, the broadly-triangular leaves resembling fronds of *Balanium Culcita* (Sw.), Klfs. The long, curved, horn-like subdivisions of the

sparingly-branched root are eaten either boiled or raw. They are outwardly black, internally white and subfarinaceous, and being eagerly sought after for food by the fishermen and Orchil-gatherers resorting to the Great Dezerta, when prevented by bad weather from procuring better provisions from Madeira, there is reason to apprehend that the plant will soon become extirpated. Already it is rare; and it was only in one place that I succeeded in obtaining a distinct sight of it, growing out of fissures, or on ledges, far down the face of the perpendicular cliff, 1200 or 1500 feet high, which forms the eastern sea-wall of the Great Dezerta, 200 feet or more below the edge. It can only be gathered by expert cragsmen, let down by ropes from the top of the lofty cliff-barriers which gird the island. It appears to flower early in the spring. In June the flowers were all over, and the seeds nearly or quite ripe. The unboiled root tastes like the tuber of *Bunium nudatum*, DC.; when boiled it appeared stringy and insipid, like a bad parsnip. It is much more dry, hard, and fibrous, than a carrot. The Portuguese however on the spot call it Rock Carrot, "Cenoula da Rocha."

12. *Chrysanthemum hæmatomma*, Lowe.—*C. fruticosum* glabrum parce ramosum, foliis succulentis rigidiusculis crassiusculis bipinnatifidis, pinnis inæqualiter inciso-dentatis basi utrinque 3–5-pectinato-dentatis, floribus subsolitariis paucisve (2–3) terminalibus in corymbum amplum digestis, anthodiis crassis carnosiss, radio pallide roseo v. carneo, disco atro-sanguineo mox conico-convexo.

HAB. In rupibus maritimis Insularum Desertarum illius præsertim Australis Bugio dictæ.

A genuine *Chrysanthemum* of De Candolle's sixth Group, *Magarsa*, notwithstanding the remarkably convex disc of the receptacle, which becomes hollow and more conical as the seeds ripen. Nothing can exceed the beauty of this fine plant as seen by Mr. Wollaston and myself early in June, 1855, on its native rocks of the Bugio, with its masses of large pink flowers, varying from full rose to the faintest blush or almost pure white, visible a long way off on the high perpendicular barren cliffs towards the summit of the island. Even the white-flowered state is at once distinguishable from its nearest allies, *C. pinnatifidum*, Linn. fil., and *C. dissectum*, Lowe (Novit. p. 17 or 539), of Madeira, by the dark blood-coloured florets of the disc, without recourse to the other characters of the leaves and habit.

13. *Centaurea Massoniana*, Lowe.—*C. inermis*, caule fruticoso erecto prolifero-ramoso, ramis subcorymbosis superne (novellis) albo-tomentosis foliosis, foliis lanceolatis utrinque acuminatis integerrimis rigidiusculo-membranaceis subfurfuraceo-scabriusculis nudis v. ad nervum marginemque solummodo tomentosulis l. floccosis, basi in petiolum longe attenuatis, capitulis terminalibus solitariis longe pedunculatis majusculis conico-globosis glabris, pedunculis nudis subfurfuraceo-puberulis sulcatis sursum incrassatis sub anthodio tumidis, anthodii squamis integerrimis oblongis latiusculis apice breviter palmato-setulosis innocuis haud pungentibus internis purpurascenscentibus, omnibus limbo nitidissimo glaberrimo lævi marginatis.

C. salicifolia, Sol. MSS. "Madera, Fr. Masson, 1776," Herb. Banks. No. 81! non Bieb. (DC. vi. 571, No. 27.)

"*C. salicifolia*. *C. calycibus* palmato-subspinosus innocuis, foliis lanceolatis acutis integerrimis subglabris petiolatis.

"HAB. In Madera inter rupes Pico do Ranxo, Fr. Masson." Sol. MSS. in Herb. Banks.

It is surprising that this fine *Centaurea*, discovered by Masson eighty years ago, and preserved in both the Banksian and Smithian Herbaria, has remained till now unpublished, although recognized and well defined by Dr. Solander in his MSS. as distinct from every other known species. Since 1838, when I first received from the late Dr. Charles Lemann an account of the existence of this plant in the above-mentioned Herbaria, I have repeatedly visited the supposed place of its growth, indicated by Masson, viz. the Pico do Rancho, a lofty crag or cliff overhanging the sea, five or six miles to the westward of Funchal, beyond Camera de Lobos, but in vain; and all inquiries and researches elsewhere in the island, on the supposition that some other Pico do Rancho might have been Masson's original habitat, have hitherto proved equally unsuccessful. It is fortunate that the specimens preserved in the above-named collections are fine, and in excellent condition, wanting nothing but the florets and seeds, which have perished or been lost.

The plant belongs however clearly to the thirteenth Section, *Cheirolophus*, Cass., in De Candolle (Prodr. vi. 577), of *Centaurea*; and hence it will also probably, when the florets and seeds are known, be found to come under the genus *Ptosimopappus* of Boissier. The anthodia are larger than in *C. sempervirens*, L., but with their upper or inner scales from 6–10-fimbriate at the apex, as in that species.

Notwithstanding Solander's apposite name of *salicifolia*, the leaves have rather the aspect and texture of those of an *Epilobium* than a *Salix*.

14. *Musschia*? *Wollastoni*, Lowe.—M. ? herbacea hirtiusculo-pubescent, caule succulento basi suffrutescente apice folioso, foliis (1–2-pedalibus) oblongo-lanceolatis acutis deorsum longe attenuatis sessilibus argute et concinne duplicato-serratis membranaceis nervis præsertim pubescentibus medio subsucculento subtus hirsuto, paniculæ elatæ multifloræ pyramidatae ramis divaricato-patentibus, floribus cernuis, calycis sinibus simplicibus exappendiculatis tubo prismatico 5-angulari 10-costato laciniis erectis oblongo-lanceolatis acuminatis tubo duplo longioribus, corolla lateritio-ochracea velutino-pubescente cylindrico-tubulosa laciniis angustis linearibus canaliculato-cornutis.

HAB. In adytis umbrosis convallium Maderæ rariss.

Herba macrophylla, perennis. *Caules* crassitie digiti, fere simplices, panicula e medio foliorum terminali bipedali erecta. *Folia* flaccido-membranacea 1–2-pedalia 2–6-poll. supra medium lata læte viridia sæpe pulchre purpurascentia. *Flores* magni, $1\frac{1}{2}$ –2-poll. longi. *Corolla* colore fere *Canarinæ Campanulæ*, L., v. *Isoplexididis Sceptri*, L., sc. ochracea v. aurantio-gilva lateritio v. ferrugineo-purpurascente picta, tubo tenui angusto sepalis subbrevisiore laciniis eadem superantibus. *Stigmata* 5, semipollicaria, magna, conspicua, exserta, stylo tubum corollæ superante. *Filamenta* omnino libera glabra tenuissima, basi membranacea dilatata, antheris rectis linearibus distincte cuspidatis sublongiora. *Ovarium* 5-loculare: capsula . . .

The mode of dehiscence in the ripe capsule will determine whether this highly curious and rare Campanulaceous plant be really a second species of the Madeiran genus *Musschia*. Otherwise, it will be found probably to form a new genus, *Codocnemia* or *Codoqenia*; for besides that it ill accords in habit and various other respects with *Campanula*, it will range under neither of the two great divisions, *Medium* and *Eucodon*, of that genus; differing from *Medium* in the exappendiculate sinuses of its calyx, and from *Eucodon* in its quinquelocular ovary, so that, if placed in *Campanula*, it would require the formation of a third division of the genus, *sinu calycis non oblecto, capsula 5-loculari*, for its reception. And again, though approaching *Symphphyandra*, DC. fil., in its ochraceous velvety corolla, it differs generically in its five long stigmas and quinquelocular ovary. Thus *Musschia* remains in fact the only

genus to which at present it can be referred with least disturbance and most probability; though sufficient difference, it must be confessed, exists to throw considerable doubt upon this collocation. I hope however to receive this autumn from Madeira specimens in a condition to decide the question.

I first met with two or three plants of *M.?* *Wollastoni*, June 22, 1847, in a moist dripping rocky hollow along the Levada in the Ribeira da Metade, just beginning to shoot, and each with already a fine terminal crown of leaves; but being unable to return to the spot that summer, and too easily or indolently resting afterwards on a hasty fancy of its being merely some rank luxuriant or monstrous state, due to its peculiar locality, of seedling *Isoplexis Sceptrum*, L., two of the leaves, preserved in my herbarium, recorded all my knowledge of the plant till the spring of 1855, when Senhor J. M. Moniz showed me imperfect specimens, with similar leaves, in his collection, procured from a countryman, which he very rightly judged not to belong to the *Isoplexis*. The conclusion from these data, that a new Madeiran plant remained still to be established, was shortly substantiated to our mutual satisfaction. Towards the end of August we were plentifully supplied by the same countryman, employed by Senhor Moniz for the purpose, with broken portions of a panicle just bursting into flower, gathered on "rocks a little below the Boca das Torrinhas, in the Boa Ventura." And living plants, I am informed this summer, have already reached England.

I am particularly happy to connect the name of the author of that noble work, the '*Insecta Maderensia*,' with so fine a plant, befitting in some sort his special claims as a Madeiran naturalist.

15. *Bystropogon piperitus*, Lowe.—*B. foliis ovatis crenatis mollibus utrinque cum petiolis ramulisque floriferis brevissime velutinis absque nitore obsoletissime sparsimque rari-punctatis subeveniis, cymis pedunculatis corymbosis abbreviatis, dentibus calycinis ovatis obtusiusculis tubo valde brevioribus.*

HAB. In rupibus Maderæ.

Folia minuscule $\frac{1}{2}$ —1 poll. longa membranacea subtenuia flaccido-flexilia nec rigido-fragilia, odore *Menthæ piperitæ*, L.

Habit and flowers of its nearest ally, *B. punctatus*, Hérît., but very distinct by its soft, veinless, finely-velvety, instead of strongly-veined, stiffish or rigid, and above smooth and shining, leaves, besides their

peculiar peppermint-like fragrance. I have only met with the plant in the Curral das Freiras, where it is however scarcely less common on dry rocks and banks in several places than the universal *B. punctatus*, Hérit.

16. *Juncus lucidus*, Hochst., Seub. Fl. Azor. p. 24, No. 147*, t. iv. f. 1.—*J. dense cæspitosus rigidiusculo-tenacissimus, culmo tenui compressiusculo nudo tenuiter striato basi folioso, foliis angustis linearibus canaliculatis culmos subæquantibus, bracteis 3–4 foliiformibus tenuibus duabus valde elongatis anthelam multo superantibus, anthela terminali composita ramulis erectis cymosis intus floriferis s. floribus secundis lucidis subimbricatis, sepalis subæqualibus angustolanceolatis attenuato-acuminatis trinerviis capsulam globoso-ovatum subabbreviatam apiculatam distincte superantibus.*

HAB. In humidiusculis umbrosis Maderæ.

A little known but seemingly distinct species, much resembling *J. compressus*, Jacq., to which indeed I had referred it before the acquisition of Seubert's 'Flora Azorica.' It is not uncommon in many places in the north of Madeira, delighting to grow in roads or paths in damp, shady places amongst the chestnut-woods, forming tufts with thickly-matted, not at all creeping, excessively tough roots, and numerous slender, rigid, upright stems from 6 to 12 inches high.

17. *Luzula Seuberti*, Lowe.—*L. anthela supradecomposita multiflora subsecunda nutante involucri superante, floribus badiis sparsis distinctis nec congesto-glomeratis, pedunculis 1–4-floris sæpius subunifloris, bracteis perigonique glumis membranaceo-scariosis eximie paleaceis anguste lanceolatis subaristato-acuminatis basi nervoque medio castaneis margine utrinque pallidis capsulam abbreviatam subgloboso-ovatum apiculatam duplo superantibus, filamentis brevissimis, seminibus minutis ovalibus simplicibus ecristatis, foliis latis nervoso-striatis longe acuminatis planis margine villosociliato nivospilosissimo subtomentoso integerrimis lævibus, culmo foliisque elatis 1–2-pedalibus, radice perenni tenaci cæspitosa stolonifera.*

HAB. In salebrosis rupestribus umbrosis Maderæ, rariss.

Luzula Canariensis, No. 503 of Bourgeau's Canarian plants in the Banksian Herbarium, from Teneriffe, approaches Seubert's *L. purpureosplendens*, Seub. Fl. Azor. p. 24, t. iv. f. 2, precisely in the points in which it differs from the present Madeiran plant, viz. the more agglomerate or congested flowers, and the shorter, not aristato-acuminate,

sepals. It differs however from both in the paler silvery, instead of purple or chestnut, hue of the panicle. In its larger size and habit it agrees better with the Madeiran than with the Azorian plant.

L. Seuberti therefore is characterized, and may be distinguished from both the above-named plants, by the more distinct or separate and scattered flowers, and the large, deep chestnut-coloured, filmy or chaffy, long and narrow, aristato-acuminate sepals, differing further from *L. purpureo-splendens*, Seub., in its altogether larger size and longer, broader, smooth and flat-edged leaves. For the present, therefore, it is better to record it as distinct, though it is possible that fuller acquaintance with the Canarian and Azorean plants may prove all the three to be mere forms or varieties of a single species. It is remarkable however that the Canarian plant in some respects approaches nearer to the Azorean than to the Madeiran, or at least that the Madeiran plant is not entirely in characters, as it is in geographical position, intermediate between the other two.

Ord. GRAMINEÆ.

TRIB. HORDEACEÆ (*Kth.*), *Koch.*

Gen. ARTHROCHORTUS, *Lowe*.—*Spiculæ* solitariæ, multifloræ, excavationibus *spicæ nodoso-articulatæ rectæ* immersæ, rhachi (ut in *Lolio*) contrariæ. *Gluma* univalvis, cartilaginea, concavo-linearis, *spiculum obtegens* eamque includens. *Palea* inferior cartilaginea, sæpe *sub apice aristata*; superior membranacea, mutica.

18. *Arthrochortus loliaceus*, *Lowe*.

HAB. In Insula Deserta Septentrionali Ilheo Chão dicta.

Gramen annuum lucidum glabrum læte-virens habitu *Lepturi* (*Rottboellia*) *incurvati*, L., radice fibrosa, culmis pluribus 6–18-pollicaribus decumbentibus undique diffuso-procumbentibus v. prostrato-adscendentibus ramosis nodosis geniculosis foliosis in spicas attenuato-elongatas nudas crebri-nodoso-articulatas rigidas rectas nec flexuosas mox subincurvas demum ad nodos facile diffractas imo fragillimas productis. *Folia* flaccida latiuscula plana scabra raro lævia, culmis superne vaginisque scabriusculis tumidiusculis stipulis abbreviato-truncatis. *Spicæ* longe productæ graciliusculæ caudatæ quodammodo stoloniformes apice demum acutæ subpungentes. *Spiculæ* 6–8-floræ scabræ, gluma lineari-oblonga internodia sæpissime æquante concava rhachi artissime adnata scabra omnino incluse, rachidio articulo

fragillimo scabro. *Palea* inferior flosculorum superiorum sub apice breviter aristata, paleam superiorem muticam arcte involvens, utraque scabra marginibus dense ciliolatis.

On first discovering, early in June, 1850, a few plants of this Grass growing sparingly along the low, central, rocky ridge at the top of the little Northern or Flat Dezerta, I hastily assumed it to be some state or form of *Lolium temulentum*, L. Revisiting the island with Mr. Wollaston in 1855 again at the same season, I found, immediately on landing, its whole surface sprinkled plentifully with a Grass which, forgetting my former discovery, I at once conjectured on the spot to be some species of *Rottboellia* or *Lepturus*. On closer subsequent examination and comparison, however, my two plants not only proved to be precisely identical, but could be referred neither to *Lolium*, *Lepturus*, or *Rottboellia*, nor indeed to any other hitherto constituted genus; and, in fact, the plant was altogether new. The foregoing account will serve to indicate its natural affinities and intermediate rank between *Lolium* and *Lepturus*, close to the latter, from which it is at once distinguished by its many-flowered, partly awned spikelets.

I cannot conclude this Paper without warmly acknowledging my obligations to Robert Brown and J. J. Bennett, Esq., for affording me every possible facility and kind assistance at the Banksian Herbarium with reference to the plants described in it.

*On the Transplantation of the PERUVIAN BARK-TREE into Dutch East India; by DR. DE VRIESE.**

Were this notice intended for the learned world alone, it would be necessary to treat the subject more amply than is now attempted, as nothing more is desired than to enable the inquiring reader to understand what Quinquina is, its value to mankind, and the views that have actuated the Dutch in what they have done in this important matter.

On some points of a scientific nature it has been necessary to be more diffuse than in other respects was desirable, as the greater part of the uninitiated (and who would misinterpret this term?) are not

* Extracted from a Work entitled 'De Kina-Boom uit Zuid-America overgebracht naar Java. Door W. H. De Vriese. 'S Gravenhage. (Translated by James Perriu, Professor of the English Language at Leyden.) 1855.'

generally acquainted with the specialities of natural and medical science ; in other respects, conciseness has been necessary to avoid too great amplification.

From the earliest scientific information we know that the inhabitants of South America have done nothing to hinder the unlimited collection, we should almost say robbery, of the Quinquina woods. No one thinks of their cultivation, and the Public Authority seems not to be interested in it, or is not able to be so : the latter, we should be disposed to conclude, when we consider, after Weddell, that the Quinquina district covers an extent of 2000 square miles.

We notice also that unheard-of quantities are exported ; nay, what is more, now and then whole woods are burnt up. It may be unknown to the Peruvians and Bolivians less than to Europeans, that the quantity diminishes, and that the trees, which are felled by thousands, are not so speedily succeeded by others, that replace them. Whoever descends the Andes, to visit the woods in which the Quinquina grows, finds his way from the sound of the reckless axe of the Cascarilleros, as they mercilessly, in an unexampled manner, hew these beautiful trees. This rough handling is not alone working fatally for the future, but all accounts are unanimous that an incredible quantity of bark is lost in the most reckless manner.

These circumstances have the sad consequence, which De la Condamine foresaw as probable, and that all late travellers confirm, namely that there is a visible diminution in the quantity of Quinquina trees.

Don Antonio de Ulloa,* thirty years after De la Condamine, uttered a warning against the destruction of the Quinquina woods, and proposed that strong prohibitive measures should be taken against their abuse. This, although very late, sixty-six years after, the Government of Bolivia considered, viz. in January, 1838 ; it issued an order against the exportation of Quinquina wood for five years.

Pereira† makes the remark, that as these trees are produced but in one quarter of the world, and no care is taken of their cultivation, it is nowise to be wondered at that this bark, in the course of time, should disappear from commerce.

* Writer of 'Noticias Americanas,' vol. i. 1772, 8vo. See also Hooker's 'Companion to the Botanical Magazine,' i. 247.

† 'The Elements of Materia Medica and Therapeutics,' by J. Pereira, ed. 3, vol. ii. part 2, pp. 1605 *et seq.* London, 1853.

Stevenson* declares that if the Government of America do not take care to preserve the Quinquina-tree, either by forbidding the felling of it, or by obliging the authorities of the provinces to take strong measures to prevent the destruction of the tree, it is much to be feared that this excellent production of the New World will be wholly exhausted.

Weddell, in the Introduction to his '*Histoire Naturelle des Quinquinas*,' says that his attention has been given to all sorts of Quinquinas. These are his words:—"L'immense accroissement pris par le commerce des Quinquinas dans ces parties, rendait en quelque sorte nécessaire un travail à leur sujet. A une époque aussi où la consommation de ces écorces, et surtout de leur principe fébrifuge, la Quinine, devient de plus en plus considérable, je crois qu'il peut être utile d'appeler l'attention sur les écorces qui un jour devront remplacer la Quinquina Calysaya, dont l'épuisement devient de plus en plus imminent. Ces espèces, si elles sont beaucoup moins riches en principes actifs, nous offrent encore, par leur abondance, quelque sécurité contre la chance prochaine de nous voir privés du médicament le plus précieux du règne végétal."

Several Dutch naturalists, whose zeal in the advancement of science for the good of mankind and the glory of their country is above all praise, have, for more than twenty-five years, urged upon the Government, both at home and in India, the transplantation of the Quinquina-tree from South America to Java. Those gentlemen have been Messrs. Blume, Korthals, Reinwardt, G. J. Mulder, Miquel, Fromberg, Vrolik, and others.

It will be superfluous to say that successive Ministers for the Colonies have considered these propositions, and all who were officially called to it, and could throw light on the subject, have shown their interest in, and their desire for, the accomplishment of this object.

Some of these naturalists have thought it probable that after some years, if the Quinquina-tree should be exhausted in South America, the culture of it might succeed in Java. Others have thought that neither pains nor money should be spared to transplant from Peru to Java a tree which would grow as luxuriantly there as in America.

The desirableness of the transplanting was continually kept in remembrance; but the Government supposed the thing impracticable.

* Narrative of Twenty Years' Residence in South America, ii. 60.

The wish to obtain seeds of this tree, through the Dutch consuls in different States of America, was disappointed, the difficulty of obtaining them being so great, on account of the distance of their stations from the woods of the interior of Peru, Bolivia, and New Granada. Seeds and plants were often promised by one and another, but these promises were not realized, although they were continually renewed. It was sufficiently clear that the only means to obtain seeds or plants of the Quinquina-tree was to send thither a proper person to fetch them.

To find such a person was not easy. Various knowledge, botanical knowledge, and particularly an acquaintance with the Quinquina, were required. A great constancy and intrepidity in danger and in the difficulties of long journeys in foreign countries, and especially a strong constitution, would be requisite in one charged with so important a mission.

Meanwhile the experience and information obtained by Mr. Weddell, in South America, were not lost to the naturalists of the Netherlands. His fame, but particularly his excellent writings, as well as the barks and dried specimens, collected by him in Peru, were not only known and appreciated here, but came freely into the possession of Dutchmen, and of their scientific institutions. In the Museum of Paris they were submitted to the inspection and research of the professional and interested with a praiseworthy liberality, of which the writer of this communication was able to bear witness during his sojourn in the French capital.

In the month of June, 1852, the Minister for the Colonies proposed to the King, that a proper person should be sent to South America, to collect seeds and plants, and to transport them directly to Java, and he was empowered to despatch Mr. Justus Charles Hasskarl, late Botanist of the Botanical Gardens at Buitenzorg, Java, on the mission.

The choice of so competent a man may in all respects be considered fortunate. Mr. Hasskarl, by a long residence on the Island of Java, had become accustomed to the influences of a tropical climate. He had a strong constitution, and was of middle age. For many years he had given evidence of a great love for the science, and a comprehensive knowledge of the Flora of Java. His numerous published writings evince great accuracy, perseverance, and industry. His travels and investigations in India had furnished him with an uncommon measure

of experience in travelling, particularly in overcoming the difficulties which so often arise out of the nature of a tropical soil.

From his sound judgment and caution there was every reason to believe him particularly fit for this mission; it is not to be wondered at, then, that he immediately attracted the Minister's attention who proposed him to the King for this important service. Expectation was not disappointed, as the result has shown, for the object of Mr. Hasskarl's mission to South America has been attained.

A plan was prepared and proposed, though he was left to his own judgment and prudence, and was only charged not to confine himself to the Calisaya Quinquina plant, but to collect as many as possible of the other sorts of Quinquina, which are found at various heights above the level of the sea. He was to go from Southampton to Chagres, and so on over Panama to Guayaquil and Loxa, whence he was to journey inland. To save time, preference was given to the steam-voyage to Panama, above the longer one of doubling Cape Horn, which would have caused a delay of three months at least before the traveller could reach the places from which he would have to direct his course towards the interior of South America.

On the 4th of December, 1852, Mr. Hasskarl left the Netherlands for Southampton, which he quitted on the 17th of December, on board the steamboat *La Plata*, arriving at St. Thomas on the 1st of January, 1853; on the 12th, at Aspinwall, by Chagres; and at Panama on the 14th, just three days too late to continue his voyage by the steamboat that touches at the ports on the west coast of South America.

Being thus detained, he on the 25th continued his route to Payta, to go thence to Guayaquil. With the knowledge however that the rainy season would render his journey fruitless, he changed his plan and went to Lima.

In the beginning of May he ascended the first, and then the second Cordilleras, thence he descended into the lower part of Peru. Here it was that he saw, for the first time since leaving Panama, a luxuriant vegetation, but which however was far from being comparable with that of the last-mentioned country.

To what difficulties such journeys are subject, may be generally known from the accounts of travellers in the pursuit of natural history; but it may not be uninteresting to the reader to be informed of Mr. Hasskarl's experience in that respect.

The roads over the mountains of Peru are bad, mostly not broader than a bridle-path, and there are often on one side deep and dangerous precipices; it is impossible for travellers meeting to pass each other. When the crest of the second Cordilleras is passed, the traveller finds steps rather than roads. Here the way must be traversed on foot, the baggage being borne by Indians, if one is so fortunate as to find any. Setting forth on foot by Vitoc to Monohamba and Uchahamba, Mr. Hasskarl had the satisfaction to see the first Quinine-trees in their natural state, although these were not the Calisaya Quinquina, which are found in Southern Peru and Bolivia. Returning from Monohamba, across the second Cordilleras, he went to the capital of the province of Zanja.

Near Uchuhamba Mr. Hasskarl saw a great number of true Calisaya Quinquina-trees, but he was only able to collect a few of the plants and seeds. Of that good sort he collected a large quantity of seed, besides about fifty plants, which, after being packed with much difficulty, were sent from Lima to Holland on the 28th of July, 1853. This packet contained, besides seeds of "*Calisaya*," four packets of "*Cinchona ovata*," and a small quantity of "*Cinchona pubescens*." In a letter to the Minister for the Colonies, dated 12th August, Mr. Hasskarl sent a small bladder of seeds of the "*Cinchona amygdalifolia*." After a voyage of about a month and a half, these objects arrived in a good state at Lima. They were addressed to some one acquainted with their culture, and by him packed in Wardian cases, and despatched to Panama. Owing to a misunderstanding of the carrier, they were detained there; and when, after experiencing the influence of a tropical heat, on arriving at Lima, all were dead. Here we had to lament the loss of the soil in which those plants were set in the cases, which, if it had been chemically examined in this country or in India, might have thrown some light on the culture. However the seeds arrived safely, and were consigned to the Directors of the Botanical Gardens of the Universities, and at Amsterdam. We shall revert to these seeds later. From Uchuhamba the traveller went more southerly, where the people, who had revolted against the Government, and declared themselves free, not unfrequently threatened his life, for they looked upon him as a spy of the Peruvian Government. Often, and that too in the night, wholly and suddenly forsaken by his guides, was he obliged to wander about, without the most necessary food, to seek his old track, being whole days without seeing a human being.

The opinion that the Quinquina-trees are found together in woods, growing, as it were, in company, is again, by the experience of Mr. Hasskarl, refuted. They are often scattered, and sometimes, even in the Quinquina districts, very difficult to find. Can the contradiction which, in these statements, exists between the earlier and present writers, be explained by the destruction of the woods, which has taken place during the last half century?

Arrived in the province of Caraboya, he cherished the hope that he should there find the Quinquina-trees still full of fruit and seed, and *that* from information given him. This hope was disappointed, as the seeds were already scattered.

In the latter end of September, 1853, Mr. Hasskarl arrived at Cuzco, the old Inca town. Passing from there to Sandia, the capital of the district of that name, where alone the Quinquina, as far as Peru is concerned, is collected, he put himself in connection with some old and experienced bark collectors (*Cascarilleros practicos*), to obtain information, and to make inquiry concerning the places where the Quinquina-trees grow. Thus he was enabled to see a great number and variety of the Quinquina species, but it was his misfortune to discover that he had come too late to collect seeds, for the fruits remaining on the trees had already dropped their seeds. It may not be improper to remark here that the Quinquina seed is extremely fine and light, and surrounded by an exquisitely fine membrane, so that it is easily blown away and lost, but also, that to this cause may be traced the wonderful extent of the Quinquina-trees in South America.

It was even less possible at that time to obtain young plants of those trees. In Caraboya however the trees were very scarce, much scattered, and thus rare, as the Cascarilleros had grubbed up all the old or seed-bearing trees. It is therefore often necessary to cross the great river, and thus to go over the boundary of the country of the wild Indians, with a faint hope of success, to look for these trees, and to find scattered here and there in the woods, young plants that have grown up from seeds.

In this manner, being disappointed in his expectation that his journey would be finished with 1853, he determined to return to Lima, and pass the rainy season there till April; however he changed this place, where, in the meantime, the yellow fever had broken out in a severe form, for Chili, where a cooler climate seemed to promise the

restoration of his impaired health and strength. 'Advices from the Netherlands induced him to settle at Arequipa, where he was expecting to receive news of a score of Wardian cases, which he bought at Lima, being forwarded to Islay. Having received this advice, he determined to go to a distance of 150 Spanish leagues into the interior, to make further investigations.

A series of difficulties however presented themselves, which rendered the obtaining of Calisaya plants almost impossible. Peru and Bolivia were at war with each other. In the former year, the frontiers of the latter were wholly forbidden to the Peruvians. Mr. Hasskarl however believed that the restraint had been removed, with the exception of a small port on the "*desaguadero*" (outlet), lying at the south corner of the Lake Titicaca, which favourable change might have been brought about by the departure of the Peruvian armies, under the command of Echinique, to reduce Arequipa, where the insurgents had ranged themselves under the banners of Castilla.

Bolivia was the country to which his attention was particularly directed, for there, according to the information, right or wrong, he had received, the Quinquina-trees were not so widely spread, but in certain places, called "*manchos*," appear in great numbers, and grow much higher. If he might be fortunate enough to penetrate into the more deeply situated districts of Bolivia, the chance of collecting seeds and plants was not unfavourable, as the Calisaya of Bolivia, which is collected here, is the Quinine Bark *par excellence*.

The frontiers of Bolivia were soon reached. Mr. Hasskarl was soon at La Paz, not far from the snow-mountain at Lutchis, a Bolivian frontier village, where he learned that the military order, forbidding the passage of the frontier, had not been revoked, as he had been erroneously informed.

He was thus obliged to determine to retire on the Peruvian territory, which he did, with the plan of going to Sandia in an easterly direction, keeping along the Bolivian frontier. With what pains and difficulties this expedition was attended can scarcely be conceived, unless we gave the detailed account furnished by himself, which our present space forbids. At the frontier places of Peru are often found Bolivians, who are generally Cascarilleros. For these the passage of the boundary was not forbidden, as it was for the Peruvians. They carry on their trade, have their families and abodes in Bolivia; they export all sorts

of objects or produce, and were not only disposed to serve Mr. Hasskarl, but they afforded all wished-for help, so that he was (naturally for an equivalent) very quickly supplied with plants by some, with seeds by others. Awaiting these, he went from one frontier place to another, and at last reached the above-mentioned Sandia, which he determined to make his head-quarters, and to which the objects to be delivered were to be forwarded at an appointed time, that he might pack them. He determined also to visit the places deeper inland himself, and to study, as much as possible, the *Quinquina Calisaya*.

Meanwhile, the agreement with the Bolivians for plants and seeds of *Quinquina*-trees, for which provisions and strong drinks were given to those people, to load their mules and to serve as barter, was fulfilled, and by this means he really succeeded. While Mr. Hasskarl was gone from Sandia eastwards, one of the Bolivians arrived with a very considerable number of plants. Having received information of this, he returned speedily to Sandia to secure all, that the plants might not suffer from the air and heat. On arriving, he found about 400 *Calisaya* plants, although not all of the strength for which he had agreed. The person who brought them must have had a very difficult journey to arrive at Sandia with this precious cargo.

We shall not here enumerate the difficulties and dangers with which Mr. Hasskarl and that precious burden had to contend before he had accomplished a distance of 150 leagues, to bring those objects in a safe state to a place of shipment. The necessary means were contrived and put in action to obtain the seeds promised, but in this he was not able to succeed. The person who had undertaken to secure them, and to follow him on his arrival at Sandia, to Arequipa and Islay, and for which sufficient travelling expenses were allowed, did not come; at the same time, the interest that was felt in keeping the plants alive did not admit of delay.

In the packing of the plants several circumstances required attention; first, the plants were to be made sufficiently damp to be able to reach the coast without drying up, notwithstanding the strong drying winds, and the almost perpendicular rays of the sun. Particularly was it necessary to protect them against this last, against the great warmth during the day; while on the other, it was equally necessary to guard these precious objects against the other extreme, the cold of the evenings and nights, which on those mountains is sufficiently severe.

Just in the months from June till August, the water on the high table-lands (particularly at night) is frozen to ice. If it had been the aim of the indefatigable traveller to transport the plants set in *earth*, the weight, and the consequently increased number of beasts of burden, would have caused more hindrances; the plants themselves, but particularly their roots, would certainly have been injured by the continual shaking of the animals. It was also necessary, in other points of view, to provide for the plants in such manner that they should not have to suffer; considering that large plants were difficult to preserve from the injurious external influences before mentioned. The sprigs were closely packed together, with the roots in damp moss; each packet was wrapped in the bark of Pisang stalks, and fastened with sackcloth, and made into small bales, somewhat resembling wool-bales, as those in which goods are forwarded on the llamas from the interior to the coast. The Pisang stalks necessary for this packing had to be fetched from the lowlands, on the shoulders of Indians; the moss, which did not grow at Sandia, was obtained in the mountain districts; all which, on account of the awkwardness and laziness of the Indians, cost much pains, time, and money.

But with the greatest difficulty was the necessary rope obtained. Four persons were sent into the lower woodlands to collect bark, and work it up so as to serve for rope. Strong cords were required to bind the packages on the beasts of burden; these were ordered at Cruzero, and in this Mr. Hasskarl met with cordial co-operation. The collecting of so many mules in this solitary and out-of-the-way place was no slight matter: they were weak animals that could not carry half the weight the mules of Arequipa were able to bear on their backs.

After a legion of difficulties of divers kinds, too many and too various to sum up here, the expedition started from Sandia on the 8th of June.

It seemed however as if the difficulties would never come to an end. The animals were driven forward as fast as possible, but it was necessary, for the sake of the plants, to shorten the way as much as it could be. From early in the morning till late in the evening they travelled on, almost without interruption, to leave the hill-country, with its extreme changes of temperature, behind, and to get as far off the highway as possible, that the cavalcade might incur no risk from the numbers of troops, who took possession of all transports as contraband of war, and that the plants, which were threatened with many dangers from that cause, might arrive in safety.

Arrived at Azangora, they learned that no beasts of burden were to be obtained, as they were all required by the insurgents belonging to the party of Castilla, to carry muskets brought from Bolivia to Cuzco; whereas other drivers had taken the district of the mountains, to avoid being compelled to a like service for the corps of General Roman, who was on the way from Puno to Cuzco. It appears that the strife of the two Republics against each other, and the troubled condition of the contending parties, caused the indefatigable and courageous traveller many difficulties, and almost occasioned the failure of his mission.

We will not now follow him in the enumeration of his disasters, but only say that, not counting five days when he was detained by meeting with the soldiers, he, by means of forced marches, accomplished the journey from Sandia to Arequipa in a week; thence, embarking on a ship ready for sea, he went by Islay to Callao, and thence direct to Java.

(To be continued.)

BOTANICAL INFORMATION.

The late PROFESSOR BOJER.

The scientific world, and particularly the lovers of Eastern botany, will learn with regret the death of Professor Wenceslaus Bojer, which took place at Port Louis, Mauritius, on the 4th of last June. For the last thirty years, the student of exotic botany has been familiar with his name; the 'Botanical Magazine' of Sir W. J. Hooker, and the 'Prodromus' of the late Professor De Candolle, attest the value of his scientific researches, and show the extent and variety of the beautiful trees and plants which he was the first to introduce to the notice of European botanists. The writer of the present sketch has laboured with Professor Bojer in the Royal Society of Arts and Sciences, Mauritius, for several years, and the following account of his travels and researches in countries at that time but little known and frequented, he has heard from M. Bojer's own lips.

M. Bojer was born at Prague, in Bohemia, on the 1st of January, 1800. Remarkable from early youth for the love of botany and natural science, he was noticed by the late Emperor of Austria, who consi-

derately paid for his education, and that of three other young men, destined at a future period for missions of scientific discovery, and particularly with a view to botanical research in foreign countries. In the year 1820 M. Bojer reached Mauritius, in company with the well-known naturalist, Hilsenberg. After having visited several districts of the island of Madagascar, making extensive collections of plants and seeds of all kinds, most of which were entirely new to the botanists of Europe, M. Bojer, as one of the first-fruits of his labours, sent a very extensive herbarium of rare specimens to the Vienna Museum, and was afterwards rewarded by the Emperor with a pension, and the decoration of the Order of Merit. At the instigation of Sir Charles Colville, then Governor of Mauritius, M. Bojer made a second voyage to Madagascar, and after botanically exploring its western shores, he crossed over to the eastern coast of Africa, visiting in succession Pemba, Monbaza, and Zanzibar, where he collected many new plants, most of them of extraordinary beauty. He then visited the Comoro Islands and Agalega, and the rich herbarium he brought from these spots laid the foundation of his well-known work, the 'Hortus Mauritianus.' He remained about six years in these different places, though principally residing in Madagascar, where he was intimate with King Radama, who was really a civilized Prince in the midst of barbarism, and who appreciated scientific men; particularly the English and French, thus forming a strong contrast to his usurping successor, Queen Ranavala Manjaca. The writer of this notice has often heard Professor Bojer speak in rapture of the infinitely diversified and luxuriant vegetation and botanical beauty, as well as the salubrity, of the interior of this vast island, which, on the gradually ascending heights, 300 miles inwards, forms such a striking difference to the unhealthy and miasmatic borders of the seacoast. He often regretted that the English, whom he regarded as his adopted countrymen, did not take some steps for settling in the interior of the island, so rich in mineral and vegetable wealth, and which afforded so magnificent a field for the purposes of emigration.

In the year 1837 M. Bojer published, by subscription, his 'Hortus Mauritianus,' which is well known to European botanists, and which is an enumeration of the exotic and indigenous plants growing in the island, arranged according to the Natural Orders. The value of this work is great, from the scrupulous attention given to the localities of plants, and from its pointing out the most favourable spots for the cul-

tivation of introduced species, as well as from the fact that it collects into a single volume succinct descriptions, the *résumé* of a vast number of observations scattered through a variety of treatises and volumes. It was the intention of M. Bojer to publish a supplement to the 'Hortus,' in order to specify, in botanical detail, the characters of new genera and species which he had introduced and established, superadding to this a List of the Agamous plants of the island. This necessary work was never completed; so little encouragement was given to science in the Colony, and the Government seemed to appreciate so slightly the labours of a true votary of scientific botany, that M. Bojer has told the writer of this sketch "that he had not heart to continue now what once would have been to him a labour of love." A large portion of this supplement is still in manuscript.

M. Bojer introduced into Mauritius many beautiful and valuable exotics, too numerous however to be mentioned here. We must name however that splendid tropical tree of Madagascar, the *Poinciana regia*, called by the French "Flamboyant," from its gorgeous, flame-like flowers, and which characteristic epithet is simply the translation of the Malgashe term for the tree, "Voulatzara;" the *Stachydrisum pterospermum*, from the interior of Madagascar; the *Colvillea racemosa*, from the western coast of the same island, a very splendid tree, with a charming raceme of blossoms, named after the Governor of Mauritius; the *Agathophyllum aromaticum*, the most fragrant of all the spice tribe, the fruit of which, about the size of a plum, is of a delicious fragrance, and as the tree flowers and fruits rarely, though it grows perfectly well in Mauritius, this circumstance causes it to be much sought after for the sake of that most *recherché* of all French liqueurs, the "Crème de Ravensara," the Malgashe name of the tree; the *Guilandina Bonduc*, and various other creepers; the *Achyranthes aspera*, from the Comoro Islands; the *Plumbago juncea*, from the Bay of St. Augustin, Madagascar; the *Scævola Koenigii* (the "Veloutier Blanc" of the French); a new species of *Vangueria*, *V. edulis*; and many other species, too numerous to find a place in this brief sketch. When the writer of this notice left Mauritius, M. Bojer was engaged upon a monograph of the *Mangifera* tribe, and which he intended to publish with beautifully coloured, life-size plates, to the number of eighty varieties, the publication of which, in Europe, was to have been confided to the superintendence of the writer of the present notice. His friends in Mauritius

are now thinking of fulfilling Professor Bojer's wishes in this respect, if sufficient subscriptions can be collected for the purpose.

But it was not as a botanist only that M. Bojer was remarkable; he was also an excellent chemist and geologist, as well as a scientific entomologist; and the Colony of Mauritius has benefited by his labours in each of these departments during a period of thirty-six years. With M. Louis Bouton, Charles Telfair, and that celebrated lover and protector of science, M. Jules Desjardins, he founded, in 1830, the first organized scientific institution in the Colony, "The Society of Natural History," which, in 1845, had its title changed to that which it now bears, "The Royal Society of Arts and Sciences, Mauritius." When M. Desjardins died, his widow, with a high appreciation of science, presented the fine museum of this truly great man to the Colony, and recommended M. Bojer to the Government as the fittest person to be the Curator of this museum, a situation he continued to hold till his death, though most inadequately paid. From year to year M. Bojer, as Curator and Vice-President of the Society, and M. Louis Bouton, as Secretary, laboured together with constant zeal and devotion to keep up the light of science in the Colony, and to communicate to the learned societies of Europe the results of their interesting studies. About a year ago M. Bojer was appointed Professor of Natural History and Chemistry at the Royal College of Port Louis, where, for the first time, so important a chair as that of natural science was established, though the College had been the principal educational institution of the Colony, since the taking of the island by the English in 1810. The salary for this professorship also was most inadequate, and quite unworthy of the constant and zealous labours of M. Bojer, for so many years, in the service of the Colony. His last work,—in the preparation of which he no doubt laid the seeds of his fatal malady, from continued exposure in the cane-fields for several weeks,—was an elaborate and excellent memoir on the "Borer Insect," which had committed such ravages in the island. Several capital engravings represent the insect in all its metamorphoses, and M. Bojer determined it as a new species of *Lepidoptera*, naming it "*Proceras sacchariphagus*."*

At the beginning of June, when Mauritius was just recovering from a severe visitation of the cholera, from which M. Bojer had fortunately

* The insect is doubtless the well-known species, *Diatraea sacchari* of the Rev. Mr. Guilding.

escaped, the disease known to medical men under the name of "Barbiers," and which is often so fatal in Ceylon, made its appearance in the island. M. Bojer was seized by it, and gradually sank under the attacks of this slow paralysis, and expired at noon, on Wednesday, the 4th of June, in the fifty-sixth year of his age, retaining his complete consciousness until a few minutes before his death. M. Bojer was a member of many learned societies in England, France, and Germany; and in private life was highly esteemed for the simplicity of his manners, the readiness with which he put himself at the head of any inquiry which could be useful to the colony he had adopted as his home, and for the pleasure he seemed to feel in being able to afford information to every one, from the vast stores of his accumulated knowledge. His friend and fellow-labourer, M. Louis Bouton, pronounced a touching oration at his grave, which was surrounded by a numerous and sorrowing concourse, who had come to pay the last tribute of respect to a truly worthy man, and who deeply felt the great loss the Colony had sustained. M. Louis Bouton justly observed, "*Pleine et entière justice peut-être n'a pas été rendue de son vivant à cette haute et puissante capacité, à ce savoir profond, qui eût pu briller d'un éclat si vif à Londres, à Paris, à Vienne, à Berlin.*"

Fortunately for Mauritius M. Louis Bouton remains, to continue the labours of his scientific and departed friend. He is indeed one of the few men of science in the Colony; one who has laboured in its interests with so much zeal and such disinterestedness for so many years. Mauritius owes the Secretary of the Natural History Society a debt of gratitude which it should be happy in having had at length the opportunity of repaying in some slight degree, by conferring spontaneously upon him the appointments so worthily filled by M. Bojer. Trifling though the salary may be which is attached to them, no other person should be placed in that scientific position but M. Bouton, for he was one of its most energetic originators, for many years the right-hand of M. Bojer; and in the opinion of the writer of this notice, who knows well the scientific workings of the Colony, he is the only man capable of doing justice either to the Museum or to the Professorship of Natural History. A first-rate botanist, with a mind richly stored with all the scientific knowledge of the age, a Creole of the Colony, speaking the English and French languages equally well; in constant communication with the scientific men of Europe; he at least, who has kept up the

flame of science in the Colony under so much discouragement, and with so much disinterestedness, should now receive from the hands of the Colonial Government the fitting acknowledgment of his past labours. He alone should be placed in that situation where he could honour his deceased friend, by carrying out his scientific views, and where he could be of service to his country, by stimulating the youth of the Colony to imitate M. Bojer in that which made him great, a persevering pursuit of science, and a constant desire to improve himself in every kind of knowledge, and, by so improving himself, to be in a condition to raise and ameliorate the position of all around him. J. M.

The SOAP-PLANT of California.

We have received bulbs of a Liliaceous plant, remarkable for their elongated form, including their coating (and this coating of a remarkably fibrous character), under the name of *Soap-plant*: firstly, from China, sent by our excellent friend Sir John Bowring, in 1855; and, secondly, in 1856, specimens of a *Soap-plant*, and these in flower, from California, through Messrs. Veitch, of the Exeter and Chelsea Nurseries, sent by their collector, Mr. William Lobb. Happily, by means of these latter we are able to determine the plant, and it is thus seen that the Chinese plant and that of California are one and the same: and it is not a little remarkable, that, though a plant of little or no beauty, originating in a country (viz. California) whence comparatively few plants are yet common in our gardens, and although not yet known to authors as possessing any remarkable properties, I find that no less than four good figures of it can be confidently referred to.

1. The first in point of date of publication is in 1816, in Redouté's '*Liliacées*,' tab. 564, where it appears under the name of *Scilla pomeridiana*, De Cand. (Cat. Monsp. 143). It had flowered in the Jardin des Plantes at Paris, but its native country was unknown to the author. It had been sent to Professor De Candolle by a cultivator at Bordeaux, for *Phalangium bicolor*, "qui est toute autre plante." The fibrous coats of the bulb, though *described*, are not here accurately represented.

2. In 1821 the plant was in the Nursery of Messrs. Colvill, King's Road, Chelsea, where it flowered in the greenhouse, and was figured by Mr. Gawler in the '*Botanical Register*,' tab. 564, as *Anthericum pome-*

ridianum, a name Mr. Gawler had previously applied to it in Brande's 'Journal of Science and the Arts,' i. 181;—quoting however *Scilla pomeridiana* of De Candolle and Redouté: but stating nothing of its introduction, nor of its native country, further than that "the native place does not seem to have been ascertained;" and "we suspect the plant to be of the same species with a dilapidated sample from the Cape of Good Hope, preserved in the Banksian Herbarium under the title *Anthericum scabrum*."

3. In 1834, at the late Mrs. Marryat's, flowered at Wimbledon, a bulb which had been collected during the recent surveying voyage of her nephew, Captain (now Sir Edward) Belcher, R.N.; "but she was uncertain where he collected it." This Mr. D. Don rightly referred to the *Scilla pomeridiana*, De Cand. (*Anthericum*, *Gawl.*), and published it in Sweet's Brit. Fl. Gard. ser. 2, t. 381, under the name of *Phalangium pomeridianum*; but could offer no suggestions as to its native country or property. On these we can throw a little light, for our friend Mr. J. Smith, Curator at the Royal Gardens of Kew, remembers well the receiving a letter from Mr. Barclay, the Kew Collector, during the voyage just alluded to, in which he mentioned among the remarkable plants of California the "*bulb of the Soap-plant*:" and we may here remark, that probably but for this quality the bulbs of a plant, possessing so little claim to beauty in the flowers, would never have been sent to Europe at all.

4. The fourth and last notice of this plant to which we have specially to refer, is that of Dr. Lindley, who gives a specific character, and remarks upon what he supposes a new Californian plant, in Bot. Register, 1841, Misc. p. 53, n. 111, under the name *Ornithogalum* (*Chlorogalum*) *divaricatum*. The bulbs were sent by N. B. Hindes, Esq., Surgeon on board H.M.S. 'Sulphur,' collected during a voyage in the Pacific. This notice was followed by an excellent figure in the volume of the succeeding year (1842), tab. 28. Here the native country is determined, and observations respecting the genus offered, showing that, "in a large Natural Order so extremely simple in structure as the *Liliaceæ*, the differences between the genera are necessarily very slight; and hence we find that such groups as *Scilla*, *Ornithogalum*, *Allium*, *Gagea*, *Urginea*, and many more, are distinguished as much by habit as by any absolute variations of structure." Thus he doubts if this plant be a genuine *Ornithogalum*, "none of the genuine species of which have a branched inflorescence; and its singular perianth, whose seg-

ments at first cohere by the points, while they separate at the sides, thus acquiring a globose appearance, increases the doubts that arise as to its being an *Ornithogalum*. Nevertheless, with the exception of the dispermous seeds, nothing seems to warrant the separation of the plant as a new genus." Dr. Lindley then suggests the subgeneric name of *Chlorogalum*, which the late Professor Kunth has adopted as a genus, including the two supposed species, *C. divaricatum* ("patria ignota") and *C. pomeridianum*; but which must now merge into *Chlorogalum* (if indeed the cause of botany is furthered by its adoption) *pomeridianum*.

The species would appear not to have been among the specimens in the Herbarium of Mr. Hinds, for it is not noticed in Mr. Bentham's 'Botany of the Voyage of H.M.S. Sulphur,' nor indeed does there appear to have been one plant of the Natural Order *Liliaceæ*.—the only dried specimens we have seen are of Mr. David Douglas, from California, in Mr. Bentham's Herbarium, now in possession of the Royal Gardens of Kew.

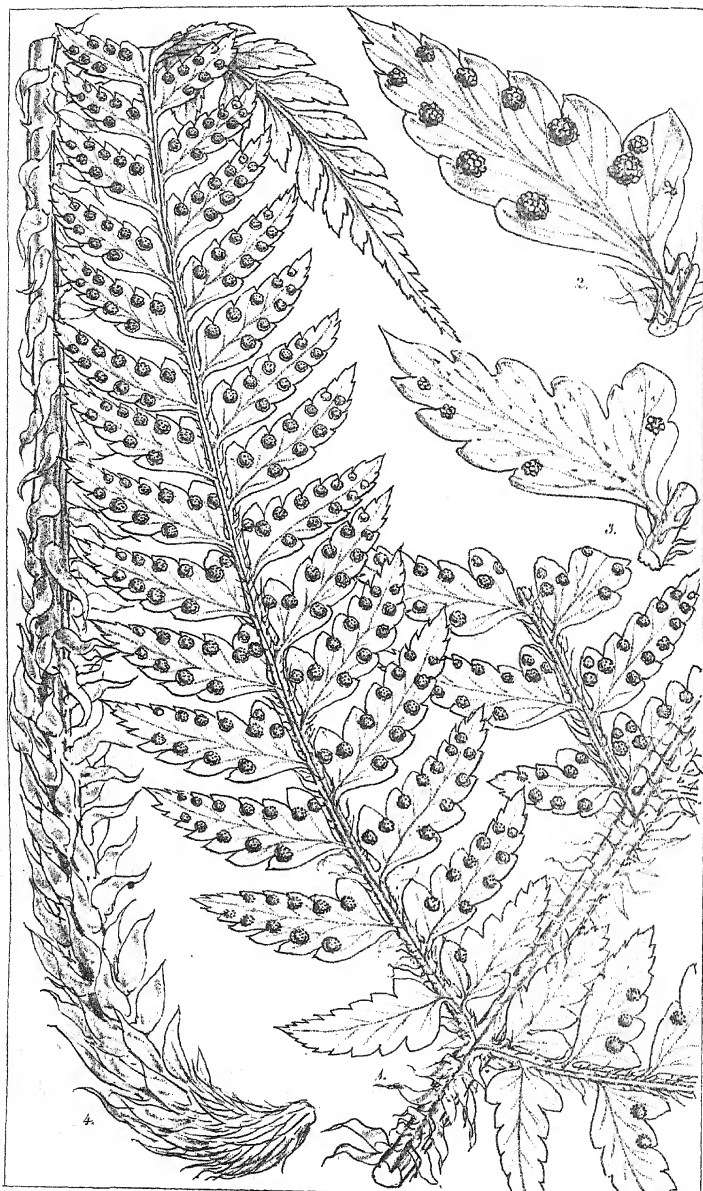
In regard to our having received bulbs of the same plant from China, this is easily accounted for. John Chinaman is a shrewd fellow, and ready to take advantage of what may benefit him in other countries as well as his own: and from California, peopled of late years to a remarkable degree by Chinese, he has carried back with him to his own country a plant that will afford him the means of washing his clothes without the need of purchasing soap. Sir John Bowring is informed that they use this bulb as soap without any artificial preparation.

NOTICES OF BOOKS.

TUCKERMAN, EDVARDUS; LICHENES AMERICÆ SEPTENTRIONALIS
EXSICCATI. Fasc. III. et IV. 4to. Bostoniæ, Nov. Angl., 1854.

These two Fasciculi form a second volume of a very valuable work, illustrative of the Lichens of North America, executed by Edward Tuckerman, Esq., a gentleman of profound knowledge in this as well as in other departments of botany. The specimens are most beautifully prepared, and attached so well and so neatly to strong paper, that the volume is as manageable as if it consisted of a series of plates instead of specimens; and nearly the whole of them in a splendid state of fructification. The two former numbers comprised 50 species, the

two present, or second volume, bring the number to 100. They are accompanied by the generic and specific name, a reference to the Author's 'Synopsis of the Lichens of North America,' the locality, and now and then some valuable notes. No. 51 is *Usnea angulata*, *Ach.*, from Texas (perhaps too near the well-known *U. hirta*). 52. *Evernia Fremontii*, *Tuckerm.* MSS., California. 53. *Evernia vulpina*, *Ach.*, California (and which may be seen on the bark of the Mammoth Tree of California, *Wellingtonia gigantea*, now exhibited in London). 54. *Evernia prunastri*, *Ach.* 55. *Evernia furfuracea*, *Mamm.* 56. *E. furfuracea*, β , *Cladonia*, *Tuckerm.* 57. *Ramalina Menziesii*, *Tayl.* in Hook. Journ. of Bot. vi. 189, first detected by Menzies, California; its fronds constitute a beautiful tissue of network. 58. *Ramalina calicaris*, β , *fastigiata*, *Fr.* 59. *Cetraria nivalis*, *Ach.*, from the summits of the White Mountains. 60. *Cetraria ciliaris*, *Ach.*, *arboricola*. 61. *Cetraria lacunosa*, β , *Atlantica*, *Tuckerm.* 62. *Nephroma arcticum*, *Fr.*, with apothecia an inch broad! 63. *Peltigera venosa*, *Hoffm.* 64. *Solorina saccata*, *Ach.* 65. *Sticta crocata*, *Ach.* 66. *Sticta quercizans*, *Ach.* 67. *Sticta scrobiculata*, *Ach.* 68. *Sticta pulmonaria*, *Ach.* 69. *Parmelia perforata*, *Ach.* 70. *Parmelia tiliacea*, *Fr.* 71. *Parmelia placodidia*, *Ach.*, *sepincola*. 72. *Parmelia physodes*, *Ach.* 73. *P. physodes*, β , *enteromorpha*, *Tuckerm.* 74. *Parmelia colpodes*, *Ach.* 75. *Parmelia caperata*, *Ach.* 76. *Parmelia incurva*, *Fr.* 77. *Parmelia ambigua*, *Ach.* 78. *Parmelia centrifuga*, *Ach.* 79. *Parmelia parietina*, α , *foliacea*, *Fr.* 80. *Parmelia chrysophthalma*, *Ach.* 81. *Parmelia speciosa*, *Ach.* 82. *Parmelia speciosa*, β , *galactophylla*, *Tuckerm.*, a most beautiful variety. 83. *Parmelia stellaris*, *Fr.*, α . 84. *Parmelia stellaris*, β , *hispida*, *Fr.* 85. *Parmelia stellaris*, γ (*tribacia*), *Fr.* 86. *Parmelia cæsia*, α (*stellata*), *Fr.* 87. *Parmelia obscura*, β , *ulothrix*, *Fr.* 88. *Parmelia fibrosa*, *Fr.*, β , *stellata*, *Tuckerm.* 89. *Parmelia brunnea*, *Ach.* 90. *Parmelia pallescens*, *Fr.*, α (*sepincola*). 91. *Parmelia ochrophæa*, *Tuckerm.*, MSS. 92. *Parmelia varia*, *Fr.*, α (*sepincola*). 93. *Parmelia cerina*, *Ach.* 94. *Stereocaulon corallinum*, *Fr.* (our *St. paschale*). 95. *Cladonia degenerans*, *Floerk.* 96. *Biatora porphyritis*, *Tuckerm.* 97. *Opegrapha stictica*, *Fr. et Tuckerm.* MSS. 98. *Trachylia phæomelana*, *Tuckerm.* MSS. 99. *Sphærophoron fragile*, *Pers.* 100. *Gyrostomum urceolatum*, *Fr.*—This volume, equally with the former one, cannot fail to be very acceptable to the Cryptogamic botanist.



Wich. det. ed. 1848.

D. L. 2. *Asplenium Hook. et Arn.*

V. 1848. 1848.

NORTH AUSTRALIAN BOTANY, *Observations on*, by DR. FREDERICK MUELLER, Botanist to the N. W. Australian Government Expedition,* under the command of Mr. Surveyor GREGORY; in a Letter to Sir W. J. Hooker. (*Published with the sanction of the Colonial Office.*)

Main Camp on the Victoria River, 18 June, 1856.

In the expectation of joining Mr. Gregory's party, and leaving this camp again in a few days, I am anxious to avail myself of the only opportunity which might offer itself, before our return to the settlements on the eastern coast, of laying before you a short account of the principal results of my botanical labours in North and Central Australia. Perhaps I flattered myself too much when I thought the information which I gained, of the botany of this part of the globe, important enough to arrange it roughly for an early communication; but I am well aware that yourself and many of your scientific friends are watching with intense interest the progress of phytological knowledge of Australia, and moreover of these remote and untrodden parts of the country. I have therefore, with Mr. Gregory's permission, collected some of the principal notes for this letter, and appended to it the description of 12 new genera and 25 new species, which, to me at least, appeared to be extremely interesting. You will be aware that I am under the restriction of retaining all information for the Government; and if you therefore think any of my observations important enough for early publication, it will require the sanction of the Secretary of State for the Colonies, which in all likelihood will be easily ob-

* Our latest account received from the Botanist of this Expedition, appeared at p. 46 and following pages of the present volume, and was despatched from on board the 'Monarch' on the arrival at the mouth of the Victoria River. It has been stated in the 'Times' of this day (Oct. 21), that—

"On landing, the party unfortunately lost 14 horses and 150 sheep, but still established a camp on Victoria River. Early in January, Mr. Gregory, with nine officers, began to ascend the river, and finally reached its sources, in sandstone ranges, 1400 feet above the sea. The ranges run east and west; and the opposite fall of water is therefore to the south. Crossing this watershed, Mr. Gregory struck on a creek, which led him 300 miles further, west of south, to lat. $20^{\circ} 15'$ south, and long. $127^{\circ} 45'$, when he discovered the Salt Lake, in a sandy desert, correctly prognosticated by that great Australian discoverer, Sturt. Thence the party returned in safety; and Mr. Gregory was preparing for a second start from his dépôt, across the country to the east, as far as Albert River, where he expects to find more fertile land. Mr. Gregory had, during the Expedition, gained the full confidence of his party, and been throughout on the best terms with the natives."

tained, as I refrain from all general information on the results of the Expedition, since Mr. Gregory's official reports will reach England simultaneously with this letter. I only state, and am proud to do so, that I, with one of our best men, was selected to push, with the two Messrs. Gregory, into Central Australia; and I perform a pleasant duty when I thankfully acknowledge, on this occasion, that Mr. Gregory has not only given me all the opportunities which the Expedition afforded for promoting my objects, but gave me also liberty to make the best of my time during our stay on this camp, so that I was enabled to examine here the greater part of those plants which I had not yet analyzed during the progress of our travels. Thus I have written the diagnostics of more than 300 species and about 20 genera, either new to the Flora of Australia or imperfectly known, and in most instances the diagnosis is accompanied by a detailed description. You will be surprised to see the accompanying article headed by *Adansonia Gregorii*! The Gouty Stem-tree of All. Cunningham and Captain Stokes is a true *Adansonia* in every point; and who deserves more to have his name attached to the best plant disclosed by this Expedition than our leader? to whose prudence, skill, and perseverance not only the general and geographical results of the Expedition are due, but also the success of the labours of all his followers.

I am at present unable to give an accurate account of the real number of species collected; but I believe they do not exceed 800 species, exclusive of what has been obtained on the eastern coast,—a number to be considered scanty in the extreme, if we consider the actual extent of the lines of our explorations, which fall scarcely short of 3000 miles. The want of changes in the geological formation throughout the country which we traversed, may partially account for the paucity of plants; whilst, on the other hand, the whole tract is devoid of a mountainous flora, since real mountains do not exist, and the highest point of the dividing table-land, between the Victoria River and Sturt's Creek, is, according to Mr. Gregory's calculations, not elevated more than 1660! We met, only on one locality, a small granite ridge, which yielded a few remarkable plants,—amongst them the strange *Erythrina biloba*. The principal geological features are sandstone of the carboniferous series, which forms the table-land, and basaltic plains and ridges; nor is it likely that the geological formation of the country will contribute to the richness of its Flora until we leave the Gulf of Carpentaria, between

which and Moreton Bay in all likelihood the principal harvest of plants will be reaped.

Impossible as it is to send at present extensive copies of my writings home, I will endeavour to furnish you with a hasty review of my notes. Amongst *Thalamifloræ* occur 2 species of *Ionidium* new to Australia (*I. purpureum* and *aurantiacum*); of *Cissus* also 2 species, as I have been obliged to refer the *Vitis* mentioned by Captain Stokes (*C. acida*) also to this genus. Of *Capparis* I have 3 species, of *Cleome* also 3, one having pink flowers and the habit of an *Oxalis* (*C. flava*, *C. tetrandra*, *C. oxalidea*). *Sapindaceæ* comprise *Cardiospermum*, several fine new *Dodonæas*, and a new genus, *Distichostemon*, allied to *Dodonæa*. *Zygophylleæ* are, even in the interior, destitute of the genus which forms the type of the Order; but I discovered a new *Tribulus* (*T. ranunculiflorus*) remarkable for having 1-2-seeded carpels, so that, with its upper leaves alternate, it comes into close contact with *Tribulopsis*, which furnished a beautiful new species, *Tribulopsis heteranthera*, advancing the genus again to 3 species, since *T. angustifolia* has been reduced to *T. Solandri*, which, with *T. pentandra*, is very common even in the interior. *Tribulus acanthococcus* has been also seen, like *Drosera angustifolia*, from the Murray. *D. petiolaris* is common, and occasionally accompanied by other species, of which one produces beautifully blue petals. *Polygala*, mentioned by R. Brown as existing in the tropics of Australia, is represented by 3 or 4 species distinct from the southern one, but *Comesperma* is wanting, or at least not found. *Corchorus* and *Triumfetta*, both with 4 species, augment their small Order considerably in Australian botany. One species of *Triumfetta* (*T. plumigera*) is remarkable for a capsule which is not woody, and long plumose setæ of the fruit, characters that may entitle it to generic distinction. Dr. Steetz's excellent paper on Australian *Buettneriaceæ* will receive a supplement in 1 sp. of *Seringia*, 1 sp. of *Melochia*, 1 sp. of *Melhania*, 1 sp. of *Rulingia*, 1 sp. of *Waltheria*, mentioned by All. Cunningham, and 1 of *Ridleya*. *Malvaceæ* form a predominant family with many species of *Sida* and *Hibiscus*; one species of the former genus, *Sida (Abutilon) leucopetala*, having fine white flowers. *Gossypium Australe* is common as far as we went, and an *Abelmoschus* (*A. albo-ruber*) differs from *Ab. splendens*. A new *Southwellia* has quadrifid flowers, and also 2 sp. of *Brachychiton* have been seen. Of *Methorium* I met 1 sp.; of *Frankenia* 1; of *Boronia* 3; of *Polycarpæa* 4; of *He-*

mistenma 1; of *Hibbertia* several; of *Thouinia* 1; of *Pittosporum* 1; of *Elaeocarpus* 1. With *Cochlospermum heteroneurum*, *Pachynema complanatum*, *Nymphæa cærulea*, *Carapa Moluccensis*, and 3 species of *Melia*, I conclude the remarks on *Thalamifloræ* as far as they are examined.

Amongst *Calycifloræ* I noticed 2 sp. of *Trianthema*, 1 of *Sesuvium*, 5 of *Portulaca*, including the cosmopolitan species, which proved exceedingly beneficial to us, 2 sp. of *Calandrinia*, 2 of *Mollugo*, *Glinus lotoides*, and a new genus amongst *Portulacææ*. *Euphorbiacææ* are not so numerous as might be expected, comprising several *Phyllanthi*, 4 sp. of *Euphorbia*, 1 of *Rottlera*, 1 of *Leptoneura*, and two new genera, besides a few plants unexamined, and *Adriana acerifolia*. Of *Myrtacææ* I saw a new *Lhotskya* (*L. cuspidata*), 3 sp. of *Calycotricha*, 1 sp. of *Verticordia* (*V. scariosa*), 1 of *Bæckeæ*, 1 of *Kunzea*?, about 12 *Eucalypti*, including *E. rostrata*, 4 sp. of *Melaleuca*, 2 sp. of *Tristania*, 1 sp. of *Jambosa*, and a new genus (*Xanthostemon*), which requires yet to be compared with your *Backhousia*, of which I have no diagnosis at hand. *Barringtonia* shows here 2 splendid species, *Melastoma* 1, *Osbeckia* 1, *Haloragis* 3, including *H. glauca* and *H. aspera*. *Umbelliflorææ* are reduced to 3 species; two of them form a most remarkable genus, *Hemicarpus*, having only 1 mericarp developed; the third species is of the appearance of a *Sison*, and bore, on the solitary place where it was seen, neither flowers nor fruits. *Lythracææ* are more numerous in Australia than was expected, comprehending 4 species either of *Ammannia* or *Rotala*, 1 new genus (*Calopeplis*), allied to *Lythrum* and *Peplis*. Of *Cucurbitacææ* I found 1 *Luffa*, 1 beautiful *Trichosanthes*, 2 sp. of *Cucurbita*, of which one (*C. jucunda*) yields eatable fruit, and an unexamined genus. Dr. Leichhardt speaks of several other *Cucurbitacææ*, which I have evidently not yet seen. Of *Stackhousiææ* occurs but 1 sp. *Leguminosææ* form the largest Order of all, with about a dozen *Acacias*, including *A. dimidiata*, *dolibrata*, *lycopodifolia*; 8 *Cassias*, all distinct from those in the South, one having only 3 or 4 flowers (*C. oligandra*); a second and very marked species of *Petalogyne* (*Petalostylis*, R. Br., non Griesebach) which I named *P. cassioides*,* *Abrus precatorius*, *Inga moniliformis*, *Bauhinia Leichhardtii*, *Erythrina Vespertilio*, *E. biloba*,

* The diagnosis of the new *Petalogyne* is as follows:—*P. cassioides*; diffusa foliis pluri-multijugis, foliolis obovatis apice retusis vel emarginatis mucronulatis supra glabriusculis subtus cum rhachi parve pilosulis, pedunculis axillaribus solitarii

n. sp., a splendid *Agati* with white flowers 2" long, and pods often more than 2' long; *Sesbania Australasica* and two other species, one very large, with pink flowers; *Vigna*, 1 sp.; *Desmodium*, 3 sp.; *Lourea*, 1 sp.; *Diserma*, 1 sp.; *Rhynchostia*, 1 sp.; *Indigofera*, 8 sp., one being monospermous; *Psoralina*, belonging also to the genus; *Crotalaria*, 9 sp., one, seemingly *C. verrucosa*, with blue flowers, another with large green flowers; *Zornia*, 3 sp. distinct from *Z. dictyocarpa*; *Leptocyanus*, at least 1 sp.; *Teperostia*, several sp.; *Eschynomene*, 1 sp.; *Alysia*, 2 sp.; *Daviesia egna*; *Bossia*, 1 sp.; *Jacksonia*, 2 sp.; and 2 excellent new genera, *Nematophyllum* and *Oxycadium*. Many of my *Leguminosæ* are not yet examined. Amongst *Loranthaceæ* are charming plants, and I have described their vivid colours from living specimens: one has green flowers. *Onagrea* are reduced to 1 sp. of *Ludwigia* and 2 sp. of *Jussiaea*. Amongst *Rubiaceæ* I have done little else than to ascertain that the *Sarcocephalus* mentioned by Dr. Leichhardt is a splendid large arborescent *Morinda*, which I named after my unfortunate countryman; that 2 *Gardenias*, 4 *Hedyotis* sp., 4 *Spermaceæ* exist; the unexamined rest contains *Psychotricha* and some genera not noticed by Cunningham, but I have, on the other hand, not seen all those which he enumerates. *Rhamnaceæ* and *Celastrineæ* are very scarce: the former includes *Zizyphus melastomoides*, All. Cunn. I was greatly disappointed to see in the desert so little of my favourite Order, the *Compositæ*, although I presumed that they would vanish greatly in the coast tract. Having dissected all of them, I give the enumeration:—*Calotis*, allied to *C. breviseta*; *Wedelia*, 1 sp.; *Wollastonia*, 1 sp.; *Vernonia cinerea*; *Sphæranthus megacephalus*, n. sp.; *Eurybia brachycomoides*, n. sp.; *Pluchea erigeroides*, n. sp.; *Blumea Cunninghami*, *B. integrifolia*, *B. senecionidea*, a fine, tall species, with all flowers fertile, forming a new subgenus, *Asteira*; *Spilanthes australis*, *Flaveria Australasica*, *Bidens* sp., *Glossogyne tenuifolia*, *Diodontium filifolium*, an excellent new genus of *Verbesineæ*, *Eurybiopsis macrorrhiza*, *Myriogyne minuta*, *Sphæromorphæa petiolaris*, *Therogeron integerrimus*, *Rhodanthemum minus* and *odoratum*, a new genus close to *Vittadinia*, *Monenteles*, 2 sp., *Gnaphalium luteo-album*,

unifloris calyce longioribus, stylo cymbiformi acuto integerrimo basi hastata valde curvato, sepalis inæqualibus.

In deserto ad flumen Sturt's Creek, necnon ad ripas glareosas fluvii Victorie superioris.

Præter notas datas diversa a P. labicheoide (*Petalostyli labicheoide*, R. Br., in Sturt's 'Central Australia,' App. p. 80) statura humilior et foliis multo minoribus.

Chrysocephalum sp., *Helichrysum bracteatum*, *H. spathulifolium*, n. sp., *H. leptorhynchoides*, n. sp., *Coleoroma Centaurea*, an interesting n. g. of *Centaurineæ*. *Sonchus* and *Senecio* are wanting! *Stylidium* has been augmented by 9 n. sp., of which it was advantageous to describe them minutely from fresh specimens. *S. rotundifolium* and *S. alsinoides* have also been seen. *Lobelia* comprises 2 n. sp. Of *Goodenovieæ* I shall be able to add to Prof. De Vriese's new work: I found about 20 species, of which *Scævola Koenigii*, *revoluta*, and *ovalifolia*, *Calogyne pilosa*, *Goodenia purpurascens*, *mollis*, and *hispida* are described by R. Br. The rest contains *Goodenias*, some of great beauty, *Scævolas*, 1 *Vellea*, and 1 *Leschenaultia*. 1 *Scævola* is remarkable for having yellow flowers and exactly the appearance of a *Goodenia*, but a quadrilocular drupe.

Among *Corollifloræ*, *Convolvulaceæ* are as numerous as might be expected, but yielded little new (two or three species of *Ipomœa*). Of Brownian species I found *Convolvulus multivalvis*, *Ipomœa denticulata*, *eriocarpa*, *alata*, *longiflora*, *heterophylla*, *dissecta*, *gracilis*, *pannosa*, *erecta*, *hederacea*, *incisa*; all the 3 species of *Breweria*; *Evolvulus*, which seem to belong to our polymorphous species, and one or two *Polymeria*; also *Cressa Cretica*. *Ipomœa biflora* is a var. of *I. erecta*. *Apocynæ* contain *Parsonsia velutina*, *Balfouria saligna*, *Carissa ovata* and *lanceolata*, and *Strychnos lucida*. Of *Sapotæ*, I have only *Sarsalisia sericea*; of *Campanulaceæ*, *Wahlenbergia gracilis*; of *Myrsinæ*, *Hygiceras fragrans*; of *Ebenaceæ*, *Maba ovata* and *Diospyros rugosula*; of *Jasmineæ*, *Jasminum divaricatum* and *J. molle*. *Myoporinæ* and *Verbenaceæ* are very interesting: the former are augmented by *Eremophila tuberculata*, n. sp., and *Pholidia stenochiloides*, n. sp. I saw also *Myoporum tenuifolium* and *Stenochilus longifolius* and *maculatus*. The latter Order afforded an *Avicennia*, distinct from the southern species, to the Australian Flora. Two new species of *Vitex* (*V. cardiophylla* and *V. triphylla*), besides *V. ovata*, a *Lippia*, a new *Ptilhyrodia* (*P. exsucca*), and a fine new genus from Central Australia, which I beg to name *Newcastelia*, to evince my gratitude to the exertions of his Grace the Duke of Newcastle in behalf of the North Australian Expedition. Of all the Brownian plants, I saw only *Clerodendron inerme*, *Vitex ovata*, and *Callicarpa adenophora*. *Labiata* are vastly at the decrease. I found only a new *Teucrium*, *Anisomeles salvifolia*, *Mentha australis*! 2 *Plectranthi*, not enumerated in the Prodromus; *P. moschatus*, of which *P. parviflorus*, R. Br. (non W.), is a variety.

Boragineæ contain a new tetrandrous genus with lobed leaves (*Lobophyllum tetrandrum*), *Halgania solanacea*, n. sp., *Heliotropium diversifolium*, n. sp., *H. pimeloides*, n. sp., *H. ventricosum*, *H. paniculatum*, *fusculatum*, *tenuifolium*, *ovalifolium*, *Trichodesma Zeylanicum*, and an *Ehretia*. The small genus *Josephinia* is increased by 1 sp. *Bignoniaceæ* received, to *Spathodea heterophylla*, a new one (*S. nematophylla*). *Acanthaceæ* contain *Nelsonia campestris*, 3 sp. of *Adenosma*, 1 of *Dicliptera*, *Hygrophila angustifolia*, 1 sp. of *Rostellularia*, *Hypoestes floribunda*. *Asclepiadeæ* contain 2 very distinct *Gymnemas*, a new *Cynanchum*, *Microstemma tuberosum*, *Oxystelma carnosum*, *Sarcostemma Australe*, *Secamone ovata*, *Gymnanthera nitida*, *Cynanchum pedunculatum*, and a few unexamined plants. *Scrophularineæ* yielded a yellow *Mimulus*, *Buchnera asperata*, *curviflora*, *parviflora*, *Centranthera hispida*, *Lindernia scapigera*, *alsinoides*, and 2 sp. of a genus which differs solely from *Lindernia* in being diandrous; *Morgania glabra*, *pubescens*; a *Gratiola*, *Herpestis floribunda*, *Limnophila gratioloides*, *Microcarpæa muscosa*, and a genus which differs solely from *Peplidium* in its one-celled anthers. *Solana* are not unfrequent: *S. echinatum* and *biflorum* I recognize with certainty amongst them; the latter is distinct from my *S. pulchellum*; *Physalis parviflora* is rare; Leichhardt's *Datura* has not yet been seen. *Gentianeæ* contain, besides *Orthostemon*, *Erythraea* and *Limnanthemum crenatum*, *geminatum*, and *nymphææfolium*, a new pygmæous species of the latter genus, with small white flowers (*L. minimum*), and a host of *Mitrasacmes*, which are, with exception of *M. ramosa*, *laricifolia*, *prolifera*, *elata*, *stellata* (with yellow flowers), new. *Utricularia* has 4 sp. here; *U. chrysantha*! *U. exoleta*, *U. azurea*, n. sp., *U. fulva*, n. sp.; the latter resembles more an Orchidaceous plant than anything else. *Plumbagineæ* have *Ægialitis annulata* and *Plumbago Zeylanica*.

None of the Monochlamydeous Orders is here extensive, which I regret, particularly with regard to *Proteaceæ*, of which I have seen the following:—*Persoonia falcata*, *Banksia tomentosa*, *Grevillea Goodii*, *G. Dryandri*, *G. chrysodendron*, *G. heliosperma*, *G. refracta*, *G. leucodendron*, *G. mimosoides*, *G. striata*, *G. agrifolia*, *G. angulata*, *Hakea longifolia*, *H. arborescens*, and a new species allied to the former. *Grevillea* yielded only 2 new species, which, with the first *Helicia* found in Australia, I have described in the following pages, in order, if you would show me the kindness, that Prof. Meisner might insert

them yet in the appendix of his monograph.* I did the same with a new *Pimelea*, which, with a blood-red species, perhaps *P. punicea*, represent alone *Thymeleæ*. *Laurineæ* are reduced to 1 species of *Gyrocarpus* and *Cussetha*; *Olaceæ*, to *O. aphylla*. *Santalaceæ* contain *S. lanceolatum*, which has black fruits, *Exocarpus latifolia*, and *Anthobolus filifolius*. *Oenopodieæ* are much rarer, as I expected, even in the saline parts of the desert; but some of the species are new, as of *Anisacantha* and *Kentropsis*, a remarkable little *Blitum*. I saw further *Salsola Australis*, of which *S. macrophylla* seems to me a var., *Halocnemum Australe*, *H. Indicum*?, *Arthrocnemum Arbuscula*, the Mitchellian *Kochias*, *Encycloma tomentosa*, *Rhagodia hastata*, *Oenopodium auricomum*?, *Rhagodia* sp. Of the *Amaranthaceæ* I have been unable to determine all, not having Moquin's excellent memoir at hand. There are several; *Euxolus* species, *Trichinium incanum*, *T. nobile*, *T. gracile*, *T. distans*, *T. Preissii*, *Plilotus corymbosus*, and two other species, of which one is remarkable for opposite leaves; *Gomphrena*, several species, *Alternanthera denticulata*, which I think is not to be distinguished from *A. nodiflora*; also a little, erect species, *Achyranthes Australis*, which passes gradually into *A. canescens*. *Polygonum Cunninghami* is very common on the half-saline banks of the Victoria River, as also in many places of the interior, besides which, only another species of *Polygonum* occurs. *Nyctagineæ* reckon only one *Boerhaavia*, but this so polymorphous, that I should not be surprised to see it under six names in the collections; it is often pentandrous.

Of *Cycas*, I saw *C. media*; of *Coniferae*, 1 *Callitris*, 1 of *Casuarina*; of *Ficus*, 5 species. But is it not extraordinary that in all my travels here I met with only 2 species of *Orchideæ*,—*Cymbidium canaliculatum*, and a *Dipodium*, distinct from *D. punctatum*? Equally startling it must appear, that even on the shady moist banks of this noble river, or on its fine cataracts well overhung with Ferns, hardly any Mosses or Lichens exist! I saw only one *Hypnum*, allied to *H. cupressiforme*, and *H. Muelleri*, in fruit! and the sterile species do not amount to more than five or six. With the exception of Grasses all Monocotyledonous Orders are comparatively limited. I have *Seaforthia elegans*, *Livistonia inermis*, *Cesia gilva*, n. sp., *Chlorophytum xerolinum*, n. sp., *Thysanotus chrysanthurus*, n. sp., *Asparagus fasciculatus*,

* The monograph of Professor Meisner, to which Dr. Maeller alludes, has very recently appeared in the volume of De Candolle's 'Prodromus.'

three new species of *Hæmodorum*, *Xyris lævis*, *X. pulidosa*, and a new one, a *Typhonium*, which forms a subgenus distinct from *Sauratium*; several *Eriocaulons*, one *Triglochin*, *Crinum angustifolium*, *Pandanus pedunculatus*, and a species with free drupes, which, if distinct from the Indian kinds, may be called *P. aquaticus*, as it indicates, and lives permanently in water, and has been introduced as "Water Pandanus" in Dr. Leichhardt's work. *Tacca pinnatifida* is common; *Najas Indica*, *Potamogeton natans*, a *Ledebouria*!, and a new *Alisma* (*A. acanthocarpum*) remarkable for a limited number of thorny carpels, are our water plants. *Typha*, 1 species, *Dioscorea bulbifera*, *Anguillaria Indica*, *Cartonema spicatum*, *Anilema anthericoides*, *Cyanotis*, n. sp. (*C. canaliculata*), *Commelyna undulata*, and a species not described by R. Br. *Flagellaria Indica*, and one *Desvauxia*, comprise the rest of *Monocotyledoneæ*, with exception of *Cyperoideæ* and Grasses. Of the latter I can only say, that, to our horses' delight, they prove next *Leguminosæ* to be the largest Order in this part of Australia, and contain a good deal that is new; for instance, two undescribed *Anthistirias*, two new species of *Cenchrus*, several, at least in Australia, unknown; *Andropogons*, *Neurachne*, *Oryza*, *Lappago*, and *Glyceria* seem formerly unnoticed within the tropics of Australia. I have recognized *Sporobolus Indicus*, *pulchellus*, a species of *Perotis*, several *Aristidas*, *Poa polymorpha*, *P. tenella*, *Triodia pungens*, *Arundo Phragmites*, *Eriachne squarrosa*, *glauca*, *avenaria*, *capillaris*, *Pappophorum pallidum*, *P. purpurascens*, *Triraphis pungens*, *T. mollis*, *Ectropia leporina*, *E. spadicea*, *Dactyloctenium*, sp., *Chloris*, several species, including *Chl. Moorei*, *Cynodon tenellus*, *C. polystachyos*, *Milium*, sp., *Paspalum orbiculare*, a new species, *Panicum gracile*, *argenteum*, *P. holosericeum*, *P. Crus-Galli*, *P. semialatum*, *P. decompositum*, *P. lævinode*, *P. papposum*, *P. spinescens*, and several which I consider new. *Xerochloa*, sp.; *Thouarea*, sp.; *Spinifex longifolius*, *Anthistiria australis*, *Andropogon intermedius*, *bombycinus*, *fragilis*, *citreus*, *Erianthus irritans*, *E. fulvus*, *Imperata arundinacea*, *Ischæmum rotthoellioides* and other species, *Rotthoellia formosa*, *Ophiurus corymbosus* and a second species. Amongst *Cyperoideæ* is a *Scirpus*, new for the Australian flora, several *Cyperi*, *Hypælitium microcephalum*, *Fuirena glomerata*, *Isolepis barbata*, *Heleocharis compacta*, *H. capitata*, about twenty *Fimbristylis* sp., which I have all minutely described, as the greater part is new; *Abildgaardia* sp., *Rhynchospora longisetæ*, *Scleria margaritifera*, *S. pygmæa*. I am sorry to state that

I shall be unable to contribute much to your collection of Ferns, as they are your particular favourites. I have collected *Marsilea*, what I consider *M. quadrifolia*, in numerous forms, *Schizaea bifida* (very rare), *Blechnum striatum*, *Nephrodium propinquum*, *Acrostichum fraxinifolium*, *Platycoma microphyllum*, *Gleichenia microphylla*, *G. Hermannii*, *Notochlana vellea*, *Cheilanthes tenuifolia*, *Pteris umbrosa*, an *Ophioglossum* and a *Lycopodium*, both undescribed in R. Br.'s work. *Fungi*, at least the larger kinds, are very rare indeed.

Taking a retrospective view, you will observe that the following Orders of plants, occurring in other parts of Australia, are here either entirely obliterated, or that they can be only very scantily represented, for of none of the following has a single plant been obtained throughout five degrees of longitude and six degrees of latitude:—*Ranunculaceæ*, *Magnoliaceæ*, *Cruciferae*, *Papaveraceæ*, *Hypericinæ*, *Geraniaceæ*, *Linææ*, *Oxalideæ*, *Tremandreeæ*, *Elatineæ*, *Scleranthææ*, *Mesembryanthemææ*, *Tetragoniaceæ*, *Nitrariaceæ*, *Ceratophylleæ*, *Cunoniaceæ*, *Rosaceæ*, *Caprifoliaceæ*, *Araliaceæ*, *Brunoniaceæ*, *Epacrideæ*, *Oleineæ*, *Primulaceæ*, *Orobancheæ*, *Plantagineæ*, *Tallitrichineæ*, *Atherospermeæ*, *Castaneæ*, *Irideæ*, *Hypnoideæ*, *Aphyllanthaceæ*, *Smilacineæ*, *Xerolideæ*, *Junceæ*, *Hydrocharideæ*, *Lemnaceæ*, *Restiaceæ*. Several common genera of the South have likewise never been met with; for instance, *Carex*, *Lepidosperma*, *Sonchus*, *Senecio*, *Pultenæa*, *Dillwynia*, and most of the allied genera, *Pomaderris*, *Leptospermum*, *Stellaria*, etc.; but my list contains, as you may observe, many genera never noticed by any writer on Australian phytology. *Melochia* is in this behalf perhaps most interesting.

I might have extended this summary much further; but, in the hope that it will convey to you a general idea of the Flora of this part of the globe, I shall close it here, praying you will excuse its hasty compilation, as the greater part is written at night-time. I reckon to be able to add, between this and the Gulf of Carpentaria, 100 new species to the collection, although the autumn season is unfavourable. At all events, I shall be able to add to my notes, and to increase the collections of seeds. The greatest harvest I can expect to reap is between the Gulf of Carpentaria and Moreton Bay, provided that Mr. Gregory is able to increase his party to such a number, that I can join again. I believe that we shall require three months to reach the Albert River, and we will start tomorrow. Our party consists of Mr. A. Gregory, Mr. H. Gregory, Mr. Elsey, three men, and myself. I have for my share to

attend to five horses, which I have of course to saddle and to pack,—which is but a fair and necessary arrangement, as actually every individual is only attending thus to the conveyance of the means of his subsistence and his comforts. Should circumstances frustrate our meeting the vessel, we might then be expected to reach, under the protection of Providence, Moreton Bay or some part of the eastern settlements in eight or nine months. Considering this emergency, our equipment is as light as possible, to enable us thus to carry the greatest quantity of food (flour, rice, salt pork, tea, and sugar) possible; I could therefore not convey more than half a ream of light paper. I was under similar restrictions when we pushed into Central Australia, as we might have been cut off from our retreat, like Captain Sturt, for many months; the consequence is, that the number of specimens brought from the interior is but limited; and I regret to say, that many are in a sad condition, many having been carried more than 1500 miles on horseback. I only hope that, after having escaped narrowly soaking in fording the watercourses at various times, they will safely reach their destination.

Before concluding this letter I have to ask a great favour, Sir William; namely, if I find other circumstances not adverse, to be permitted to take myself the collections home to England for description. My review of *Crotalaria* and other genera has proved to me sufficiently, that I ought to compare the Indian plants before I can safely establish Australian species, in many cases. One year and a half at home would be sufficient for this purpose, if you would extend towards me your well-known liberality, and open me your collections; and I think the Government might at least give me a free passage, since I have not been incurring expense to them previous to my arrival in Sydney. This home journey would also give me the opportunity to publish the Flora of Australia Felix and South Australia, for which I might consider my materials almost complete. How delightful it would be to me to express personally my veneration for you!

Mr. Baines desires to be remembered to yourself and to the famous Dr. Burchell; and I wish that you, Sir William, as well as Drs. Hooker and Harvey, and Mr. Latrobe, will retain in kind remembrance your most obedient and devoted,

FRED. MUELLER.

(To be continued.)

Definitions of Rare or hitherto Undescribed AUSTRALIAN PLANTS, chiefly collected within the boundaries of the Colony of Victoria; by Dr. FREDERICK MUELLER, Government Botanist for the Colony of Victoria.

(Continued from p. 210.)

169. *Phyllanthus lacunarius*, F. Muell.; annual, smooth, glaucous; stem upright, branched; branches angular; leaves imbricate, deciduous, obovate or cuneate-oblong, obtuse, on short petioles; flowers monœcious, axillary, solitary, on short pedicels; sepals minute, subovate, obtuse, with broad, membranaceous margins; stigmata very short; capsule depressed, trigastrous; seeds trigonal, blackish, with longitudinal streaks.

HAB. On the margins of lagoons which become dry during summer, at the junction of the Murray and Darling Rivers.

170. *Phyllanthus Fuernrohrii*, F. Muell.; fruticulose, upright, branched, with a grey, velvet-like indument; branches nearly terete; leaves imbricate, deciduous, spathulate-obovate, on very short petioles, apiculate; pedicels axillary, subsolitary, half the length of the leaves; sepals lanceolate-ovate, acutish, with membranaceous margins, outside as well as the depressed capsule hairy-scabrous; seeds brown, lævigata.

HAB. On gravelly sand-hills near the Murray; rare.

This species received its name in grateful acknowledgment of much kindness which the author experienced from Professor Fuernrohr, in Ratisbon.

XLVII. JUNCAGINÆ.

171. *Triglochin nanum*, F. Muell.; annual, extremely small; root fibrous; leaves narrow-linear, channelled, nearly blunt, shorter than the threadlike, somewhat angular scape; fruits on spreading stalks, pyramidal-linear, consisting of three carpels, which are slightly dilated at the base, inside glabrous, on the back very thin-keeled, and on both sides narrow-margined.

HAB. On mossy rocks frequent in South Australia, rarer in Victoria. Quite of the habit of *T. centrocarpum*.

XLVIII. ASTELIACÆ.

172. *Astelia psychrocharis* (Sect. *Tricella*), F. Muell.; root thick;

leaves rigid, from a broad base narrow-lanceolate, sharp-keeled, on both sides, together with the scape, silky, their margins nearly flat; female racemes few-flowered, condensed to a conglomerate panicle which is much shorter than the leaves; calyx persistent, outside silky; capsules baccate, red, ovate, beaked with the style, three-celled; seeds angulate, ovate, shining.

HAB. On wet, mossy places in the Australian Alps, at sources of the Murray and Snowy Rivers.

Leaves much broader, but not longer, than those of the *A. alpina*.

173. *Xerotes juncea*, F. Muell.; stemless; leaves long, terete or slightly compressed, streaked, with toothless, pungent apex, much longer than the simple, few-headed scape; flowers of each sex conglomerate-verticillate.

HAB. In the Port Lincoln district, *C. Wilhelmi*.

Much more robust than *X. spartea*, and in some degree also allied to *X. leucocephala* and *typhina*.

XLIX. ERIOCAULONEÆ.

ELECTROSPERMA, F. Muell.—*Flowers* in androgynous heads, all furnished with a bracteole. *Receptacle* conical, as well as the bracteola smooth. *Male flowers* central, pedicellate. *Sepals* smooth, the three external coherent at the base; the three internal concrete into a long tube, the free lobes bearing a gland. *Stamens* six, inserted on the limb. *Anthers* bilocular, introrse. *Female flowers* marginal on short pedicels, destitute of a calyx. *Style* one, short, with three filiform stigmata. *Capsule* smooth, tricocous, loculicide-dehiscent. *Seeds* in the cells solitary, smooth, not costulate, of the structure of *Eriocaulon*.

This genus is chiefly characterized by the want of the floral envelope in the female flowers, but agrees otherwise in habit and structure with *Eriocaulon*. The name is derived from the colour and shining transparency of the seeds, not unlike amber.

174. *Electrosperma Australasicum*, F. Muell.

HAB. On wet places along the Murray, towards the junction of the Murrumbidgee.

A small, annual, scape-bearing herb; leaves grass-like, fenestrate-nerved, pellucid; scape monocephalous, vaginate at the base.

L. CYPEROIDEÆ.

175. *Scirpus polystachyus*, F. Muell.; stems tall, trigonous, foliate,

glabrous; leaves flat, on the keel and margins scabrous; cyme terminal, many times compound, little shorter than the three or five bracts of the involucre; spikelets ovate-oblong, partially solitary-stalked, partially glomerate; bracteoles somewhat keeled, lanceolate-ovate, awnless, naked on the margin, blackish-green and somewhat scabrous at the back; style trifid; caryopsis roundish-ovate, plano-convex, slightly angulate at the back, short-mucronate, pallid, even; the hypogynous bristles at the top puberulous, variously curved, much longer than the fruit.

HAB. Along the rivulets and streams of the lower part of the Australian Alps; for instance, at Mount Leinster, Omeo, and Gibbo Creek, Snowy River, etc.

Spikelets of the size of *Scirpus radicans*, between which species and *S. silvaticus* it seems intermediate.

I add here the only new species of *Scirpus* with which I am acquainted, although not alpine.

176. *Scirpus leptocarpus*, F. Muell.; dwarf, annual; root fibrous; stems numerous, slender, angulate, streaked, one-leaved at the base; spikelets one to three, spuriously lateral, ovate, sessile, many-flowered; one bract of the involucre elongate, erect, at last horizontal; the other of the length of the spikelet; bracteoles oblong, acuminate, slightly recurved at the apex, straw-yellow, with brownish margin and green keel; style trifid; caryopsis trigono-cylindrical, finely dotted; hypogynous bristles white, slightly scabrous.

HAB. On moist or sometimes inundated localities on the Murray, Ovens, and King River.

177. *Carex polyantha*, F. Muell.; tall; leaves broad-linear, nearly flat, keeled, with the erect triquetrous stem a little scabrous; male spikes four or five, elongate-cylindrical, the lowest ramified by several short ones; female spikes three to five, very long, cylindrical, the lowest long-pedunculate, with remote flowers at the base; lower bracts very long, foliaceous, auriculate but not vaginate at the base; stigmas two; fruit brown, ovate, sessile, glabrous, dotted, on both sides convex and distinctly streaked, abruptly terminated into a very short, bidentate beak, as long as the lanceolate-subulate, black bracteoles; caryopsis compressed, round-ovate, straw-yellow, shining, even.

HAB. In the valleys of the Upper Mitta-Mitta, near Mount Hotham.

More allied to *Carex acuta* and *paludosa* than to any of the Australian, Antarctic, and New Zealand species.

178. *Carex cephalotes* (Sect. *Psyllophora*), F. Muell. ; dwarf ; root fibrous ; leaves narrow-linear, channelled, scabrid, as long as the smooth, thin, triquetrous stem ; spike terminal, solitary, androgynous, dense-flowered, roundish-ovate, generally bractless, with male flowers at the summit ; stigmas two ; fruit spreading, lanceolate-ovate, very short-stalked, terminated by a short, undivided beak, nerveless, even, green, with black-brown tip, slightly convex at the back, longer than the brown, ovate, acute, persistent, one-nerved bracteoles ; basal arista wanting ; caryopsis round-ovate, tapering into the base, brownish-yellow, even, shining.

HAB. On the grassy summits of the Munyang Mountains, moistened by the perpetual glaciers, or on the most elevated springs.

One of the handsomest species of a large cosmopolitan genus, allied to *Carex capitata*, from European and Asiatic Alps.

179. *Oreobolus distichus*, F. Muell. ; leaves long, distichous, laxly imbricating, somewhat spreading, incurved, channelled, subulate, flat towards the summit, dilated and equitant at the base, serrulate-scabrous on the margin ; peduncles angulate, furrowed, at last tereti-compressed ; bracteoles two or three, large, unequal ; scales of the perigynium lanceolate, acuminate ; caryopsis even, ovate, acuminate.

HAB. In peat-moss on the highest summits of the Australian Alps. Allied to *Oreobolus pectinatus*.

The present species must be considered as an interesting addition to the genus. For a long time *Oreobolus Pumilio*, originally from Tasmania, now also observed in the Australian Alps, remained the only species. Gaudichaud added *Oreobolus obtusangulus* from the Hermite and Falkland Islands, and J. Hooker *O. pectinatus* from Lord Auckland's Group, Campbell's Island, and New Zealand. Thus it appears that all these islands possess only an isolated representant of the genus.

180. *Carpha nivicola*, F. Muell. ; rhizome creeping ; stem very short, smooth ; leaves and lower bracts broad-linear, blunt, with scabrous margin, flat towards the summit ; spikelets one-flowered, fasciculate, greatly surpassed in length by the leaves ; scales of the spikelets generally five, unequal, the outer ones twice or three times shorter than the rest ; the innermost solitary, linear-setaceous, toothless, or wanting ; bristles of the perigynium six, nearly to the top plumose, three times longer than the caryopsis ; stamens three ; style filiform, puberulous ; stigmas three, capillary ; caryopsis oblong-triangular.

HAB. On the highest summits of the Australian Alps, near swamps.

Closely allied to *C. alpina*. As a genus, I consider *Carpha* as near allied to *Oreobolus* as to *Cyathochaete*, *Rhynchospora*, or *Chaetospora*.

LI. GRAMINEÆ.

181. *Ehrharta uniglumis* (Sect. *Tetrarrhena*), F. Muell.; stems branched, with the vaginæ and leaves scabrous, otherwise smooth; spikelets glabrous, distinct; perianth nerved, blunt; gemmella of the lower sterile flower a little longer than the solitary glume, and as long as the hermaphrodite flower.

HAB. In humid valleys on the Brodribb River.

It bears the greatest resemblance to *Ehrharta* (*Tetrarrhena*) *contesta*, but differs from this in the equal length of the sterile flowers, and from all others in the want of the outer glume.

*Account of the GUNYANG:** a New indigenous Fruit of Victoria; by Dr. FREDERICK MUELLER, Government Botanist for the Colony of Victoria.

The number of fruits indigenous in this Colony is so limited, that any addition to them cannot fail to attract a far more general attention than even the most important discoveries in the medicinal properties of our plants, or in their geographical distribution or affinity likely would secure. With this view I selected from a series of new plants, which were obtained during my last journey through the eastern parts of this Colony, the "Gunyang," for an early publication. That the natives apply a special name to this production of our Flora warrants its usefulness in their nomadic life; and as, in fact, the Gipps' Land tribes collect this fruit eagerly, and as probably cultivation will improve it so much as to render the plant acceptable for our gardens, I hope to be excused in not having chosen a more valuable object for a special paper.

The Gunyang bush is a kind of *Solanum* or Nightshade, and has much the appearance of *S. aviculare* (*S. laciniatum*, Ait.),† to which

* *Solanum vescum*, Muell. See p. 165 of this volume.

† The Kangaroo Apple of the Colonists.

species it is indeed in habit so closely allied, that superficial observers, seeing these plants growing promiscuously, will hardly become aware of their distinction. Yet the differences between them are, through all stages of development in both plants, so clear and so decisive, that I do not hesitate to add to the enormous number of more than 900 *Solana*, hitherto described, the Gunyang, as new under the name of *S. vescum*.

It differs from *S. aviculare* in its green but not dark purplish twigs, its sessile, decurrent, somewhat scabrous, and less shining leaves, whilst those of *S. aviculare* are distinctly petiolate, and, consequently, not decurrent along the twigs; in its more tender corollas, which are very slightly, but not to the middle, five-cleft, and hardly ever outside whitish, its thinner styles and filaments, the latter not shorter than the anthers, its more acute teeth of the calyx, its almost spherical, transparently green berries with large seeds: the berries of *S. aviculare* are, on the contrary, at all times exactly egg-shaped, of an orange colour, and with seeds but half as large as in *S. vescum*. The natives of Gipps' Land, moreover, reject the berries of the former on account of their disagreeable taste. To the Peruvian *S. reclinatum* the affinity of our plant appears yet greater; yet in the careful description which Dunal has furnished of it in De Cand. Prodr. xiii. p. 68, neither the characteristic wings of the twigs are attributed to the Peruvian plant, nor do his remarks on the corolla, which he calls half-five-cleft, on the shorter pedicels and smaller calyx agree with *S. vescum*. A close approach between both is, however, manifested in the length and structure of the filaments, as also in the shape and colour of the berries. From *S. senecioides* and *multifidum*, likewise inhabitants of Peru, our species differs already in the division of the leaves, but bears resemblance to them in the winged twigs.

The Gunyang has been found, as far as I know, only yet in Gipps' Land, where it occurs on sand-ridges around Lake Wellington; on the coast towards the mouth of the Snowy River; on grassy hills at the Tambo, the Nicholson's River, and Clifton's Morass; on the rich, shady banks of the Latrobe River, and near the Buchan River. The occurrence of the plant in such varied localities proves how easily it may be cultivated in any soil. It flowers during the spring, and ripens its fruits towards the end of the summer. The berries only lose their unpleasant acidity after they have dropped in full maturity from the

branches, and then their taste resembles in some degree the so-called Cape Gooseberry (*Physalis Peruviana*), to which they are also similar in size.

On the Transplantation of the PERUVIAN BARK-TREE into Dutch East India; by DR. DE VRIESE.

(Continued from p. 312.)

It seemed as if the courageous traveller must encounter new difficulties at the end of his mission. Islay was again in possession of the party of Echenique. An attack for the conquest of Arequipa was preparing there. But the means of transport were wanting. Mr. Hasskarl required many beasts of burden to transport his packages. To obtain these there was no sort of prospect. It was feared, and, as it appeared later, not without reason, that the animals would be seized. The profits of the expedition were not an equivalent to the risk the drivers feared they should incur. The party of Castilla, which was uppermost in Arequipa, moreover, did not permit the departure to Islay, and the one danger brought on the other. At last, when damages for the possible loss of the beasts was promised in case of need, and some persons of influence in Arequipa placed themselves in the breach for Mr. Hasskarl, his desired departure was allowed. On the journey to Islay nothing important happened, but at that place however the beasts were immediately pressed into the military transport service. The Wardian cases were arrived at Islay, but the frigate did not appear till a fortnight afterwards; this induced him to depart for Callao on a vessel going thither in ballast. In three days he arrived there. On the passage Mr. Hasskarl unpacked his Quinquina plants, which he was able to do without interruption. He had reason to congratulate himself on their state, though they had been for more than four weeks shut up from light and air, when cutting through the stems a fresh colour appeared. He immediately planted them in convenient cases. On the 7th of August, late in the evening, he arrived at Callao, and on the 27th he was ready to set out for Java, having passed the interval at Lima.

As soon as the cooler west coast of South America was left, the heat began to increase daily, so that during the greater part of the day the thermometer marked 80° to 86° Fahrenheit. This made Mr. Hasskarl

very careful of his plants, which, from his observations, have in their natural position a temperature not above 60° , and generally below 50° Fahrenheit, and sometimes even at freezing-point. The objects had much to suffer in this heat, which must have been injurious to them, since they had made, including the transport from Bolivia, a land journey of six weeks. Shades of tents, etc., might ward off the sun's rays, but the glass cases were daily obscured with steam inside. The cases were opened, to clear away the mildew that had collected in them; and it was found good to repeat the operation daily. The mildew was continually renewed, and had to be taken away. At the beginning of the voyage, and after leaving the Sandwich Islands, the cases were inspected, and those that required water were supplied with it, however very sparingly.

The stronger plants only began in any degree to sprout; the others showed no signs of doing so, although the stems evidently retained life. Some of them during the voyage began to shoot out at the root, whereas of the weaker plants, the parts above the soil appeared to be dying off, although it was apparently to be expected that they would shoot later. It was thought advisable not to endanger the plants by an untimely inspection, or loosening of the soil.

We were informed, under date of the 22nd of December, 1854, that Mr. Hasskarl had arrived at Batavia on the 13th of that month, with twenty cases containing *Quinquina* plants, and at the same time, that a longer delay at Callao was caused by the difficulty of obtaining provisions and fuel; further, that at about 150 leagues from the Philippine Islands, the ship had encountered a dreadful hurricane, and had suffered much damage. They arrived at Macassar on the 3rd of December. As a long voyage now was considered bad for the plants, Mr. Hasskarl took his collection on board a steamship stationed there, and arrived at Batavia on the 13th, as mentioned.

Measures were immediately taken by the Governor-General to transport the plants to the higher-situated Tjipannas, in which however a delay of two days was occasioned by the tempestuous weather.

Mr. Hasskarl, on his arrival, was charged with the cultivation of the *Quinquina* at Java.

We have mentioned some seeds sent by Mr. Hasskarl to the Netherlands. The consequences thereof are to be considered as resulting directly from the mission carried out by that gentleman, and what is to be said of them will find an appropriate place here.

Seeds of various sorts of *Quinquina* have successively been received at the Colonial office as follows :—

1. *Cinchona Condaminea*, Lamb., var. δ , *lancifolia*, Wedd. (*C. lancifolia*, Mutis), collected in New Granada, and presented to His Majesty's Consul-General there, Mr. Lansberge, by the famous traveller Karstens. From these seeds a few plants have been raised in the Academical Garden at Leyden. From Mr. Hasskarl were received—

2. *Cinchona amygdalifolia*, Wedd. Sent immediately to Java per Overland Mail.

3. *Cinchona Calisaya*, Wedd., from the Valley of Sandia, in the province of Carabaya, in Peru. Of this sort a quantity was sent, immediately on its arrival, by post to Java; another quantity was sown in the Botanical Garden.

4. *Cinchona Calisaya*, Wedd., var. β , *Josephinae*; sown, but come up badly in the Garden at Leyden.

5. *Cinchona ovata*, R. et P. (*Cascarilla crispilla*, *rhiqua* or *chiqua*). We were informed that this, like No. 4, grows as a shrub in the neighbourhood of Hohubamba (Peru), 5–6000 Paris feet, on sunny slopes; whereas No. 5 grows at 6–7000 feet in high woods, and even on slopes in a mouldy soil, more or less mixed with mica-slate, which circumstances were taken into consideration in laying the seed to germinate, and in the raising of the plant.

The seeds received (with the exception of those sent directly to Java) were immediately distributed by the Minister for the Colonies to the Directors of the Botanical Gardens of the Universities and of Amsterdam, to be germinated, and further cultivated. It will be unnecessary to mention that these directors, deeply impressed with the importance of the matter, used every effort to make these objects answer the views of the Minister. In the beginning of 1854, and since, in 1855, his Excellency, even a short time after the sowing, received from the Botanical Gardens favourable reports concerning the germination.

With reference to the seeds that the Minister sent by the Overland Mail to Java, to be sown, favourable advices have been received from the Governor-General (see lower); which last circumstance induced the Minister to request the return of the seeds from the Gardens in the Netherlands, and to send them likewise by Overland Mail to East India. It will be readily seen that the Minister, in trying and promoting the matter by all the means in his power, has had no other aim than that

of assuring himself of the success of the intended transplanting. The Quinquina plants raised in the Gardens progressed in their development so much, that even in 1854 some were sent to Java. This really took place, and they were sent from Leyden, Utrecht, and Amsterdam.

1. From Leyden, plants of *Cinchona Calisaya*.
2. From Utrecht, plants of the *Cinchona ovata*.
3. From Amsterdam, plants of *Cinchona Calisaya* and *Cinchona pubescens*.

Of No. 1 favourable reports have been received; of No. 2 such are still expected.

Could there possibly be a doubt as to the correctness of the naming of the sorts of those received from Mr. Hasskarl under the name of "*Cinchona Calisaya*, Wedd."? I think not. The Government had sent a thoroughly competent person, and one who, by a long experience in the investigation of nature, had become a clever botanist, and whose writings testify to his strict exactness and scrupulous nicety in the smallest particulars; his love of truth is above all praise; his special knowledge of the subject must be a guarantee against all mistake. With such security for my conviction, I thought to be able, *à priori*, to foresee, that from the seeds which the Government has been pleased to entrust to the Botanical Gardens, if they germinated, no other plants than the Calisaya Quinine-tree would appear, under which name I received them.

The result has not disappointed the expectation. The Quinquinas here developed are *Calisaya* plants. A strict inquiry has proved this to me as certainly as science only can.

Under date of the 21st of October, 1854, the Governor-General informed the Colonial Minister that a great part of the Quinquina plants had attained such a growth that they could be planted out in a regular garden. Later advices concerning the planting out do not inform us of the preservation of the greatest number of the plants which came up from seeds at the Tjibodas, but this was not to be expected; this has nowhere, or never been the case with transplantation. Experience yet teaches us that plants produced from seeds do not always grow up and remain sound.

The result of the culture of the Quinquina, under the direction and care of Mr. Teysmann, as well those obtained from seeds of Mr. Hasskarl, as those sent on former occasions from Leyden and Amsterdam, is as follows:—

In the beginning of the month of November, 1854, Mr. Teysmann went to Tjipannas to prepare the ground for the transplanting of the Quinquina plants there.

The ground which Mr. Teysmann judged proper for the purpose was then covered with heavy wood; this however being prepared, the transplanting began. It was about half a mile above the Garden of Tjibodas, perhaps 300 or 400 feet higher than this place, and consequently 4600 to 4700 feet above the level of the sea. The soil is very mouldy, with a porous, greasy, red subsoil, in which trees of colossal height, mostly 150 feet, with a diameter of four to six feet, thrive luxuriantly, but which however are now cut down. The land lies to the north-west of the deep ravine of Tjibodas, on the slope of the Gedeh Mountains, and offers above, as well as below, good ground for extending the culture, provided that the woods be felled. The climate through the whole year, but particularly in the rainy season, is very damp, and the vegetation is at times wrapped in the clouds.

To these are now to be added the *Calisaya* plants brought directly from Peru by Mr. Hasskarl, those sent by Willink of Amsterdam, those sent and yet to be sent from the Gardens of the University and of Amsterdam, and the plants which at different times have been sent from the Netherlands to East India, besides those which are yet to come up from seeds now there; by which it may be computed that the plantations already made are, or will be in a short time, much more numerous than the success of the culture required.

How well soever we may be convinced that all the care we can desire is given to the plants by Mr. Teysmann, it is not likely that the cultivation can be taken to heart better than by him who, on innumerable occasions, has risked his life in the countries from which he brought the living trees to Java. The observations concerning their growth, and the natural state of the places where they are found, can be applied to the culture at Java. Numerous particulars, which the most curious observer, who has not visited the original places where they grow, would pass by, are here brought to bear by the experience of Mr. Hasskarl. The long residence of that natural philosopher at Java, his acquaintance with the topography of the Island, with the elevations, table-lands, mountains and their slopes, the constitution of the soil, and the comparison of all these with those in the countries where the Quinquina grows; this rich treasury of knowledge and experience, we are of

opinion, enables us to look for success to attempts so well undertaken.

With all that has already been said with regard to the measures taken by the Government, and the direct importation from South America by Mr. Hasskarl, we think it not improper to say a little of what has been done by means of botanical gardens in the Netherlands, and by one private person, Mr. J. Willink, in the cause of this weighty matter, although those endeavours alone would not, in our opinion, have attained the object of the importation.

From the Botanical Garden at Amsterdam the Professor Miquel sent several Quinquina plants to Java. The results of the sending out of a Quinquina-tree to Java in 1847, under the name of *Cinchona alba*, were very favourable. This tree, after having blossomed at Java, was called there *Cascarilla Muzonensis*, Wedd., or *Cinchona Muzonensis*, Gaud. Mr. Teysmann occupied himself with the management of this tree, which is a shrub, and quickly obtained from it more than a hundred plants.

To promote the chemical investigation of this sort of Quinquina, a few branches were sent to Mr. Rost van Tonningen, then apothecary at the Government Laboratory at Batavia; an analysis which, on account of the small quantity of bark, was not easy. There was no Quinine in it, but a resin which unmistakably had the smell of Quinquina resin, and deserved further inquiry as soon as a larger quantity of the bark should be obtained. He determined to make a second analysis, when the trees should be older, and he should have a larger quantity of the bark.*

We remark here, that till now it is not known at what period the alkaloids develop themselves; and we may expect that a further analysis of the bark of this sort, furnished by the justly-celebrated Botanical Garden of Amsterdam to Dutch East India, will afford us a new subject of information. We may not omit to mention that, for our chemists in Dutch East India, a new field of inquiry is opening, which may be of great importance to the very difficult, and as yet imperfect, chemical history of Quinquina barks.

From the Botanical Garden at Amsterdam, besides the exports made by order of the Minister, plants of *Cinchona Calisaya* were successively

* The result of the inquiry of Mr. Rost van Tonningen was published in the *Nat. Tydschrift* (Batavia, 1852).

sent to East India,—as, in April, 1851, six plants; December, 1851, three plants; July, 1852, four plants. Mr. Willink, of Amsterdam, has also sent once or twice to Java, and thereby has shown his real interest in the good cause.

In the Botanical Garden at Paris some plants of the *Cinchona Calisaya* had grown up from seeds, sent by Mr. Weddell from South America; part of these were sent to Algiers, the rest were kept at Paris. In 1851 I saw two plants in one of the greenhouses, which, I was assured, were the only ones left. These, as I guess, were from 2—2½ feet high, and were in a healthy state. It would have been indiscreet to have asked for one of those two plants; I learned however that there was one at Messrs. Thibaut and Ketelière's, which seemed to me the same. This plant was conceded to me, and was sent from Paris to Leyden on the 21st of July, 1851. It grew luxuriantly here, and in a few weeks attained a length of 75 inches; it was sent by the Minister's orders, in an apparatus expressly made for it, to Java, on the 1st of December, 1851.

A letter from Batavia, 21st April, 1852, informed me that what I had sent had succeeded; for which, it appeared, that the minute care and the particular form of the apparatus were to be thanked. A few slips were immediately taken from this little tree; and the preservation of the plant was ensured, if unfortunately the chief stem should wither, for which, at first, there was some fear. The slips grew, and the tree also was preserved, to which its transplantation to Tjipannas certainly contributed.

The last advices from East India, concerning this plant, sent from the Botanical Garden, stated that very favourable expectations were formed of it, and that it had already attained a height of 5½ feet. Will the cultivation at Java succeed? Will the soil, the air, the light, the degree of warmth, of dampness, and other atmospheric relations, lastly, will the particular situation, suit the culture? Will the plant there find, in a word, all that it finds in its native soil that is necessary for its development in its normal state, and there everything to form all that which makes it the most valuable of all medicinal substances that the earth anywhere affords?

Of no new agricultural undertaking is the result to be considered as certain. The whole system of agriculture consists but in the exchange or transplantation of plants from one *place* to another. This

holds good for the agriculture of all Europe, and we may say the same (as far as we are acquainted with them) for the other parts of the world; but this is particularly the case with the culture in tropical districts, and with European civilization in other parts of the world. The numberless host of crops of economical or technical nature belong, rarely, or never, by nature, to the lands in which we see them raised.* But those cultivated plants are just the most useful of the whole earth. We seek and find at last, without difficulty, all the circumstances that they require, if the plants are not wholly unfit for the change of air and soil, which quickly appears. Many plants for the commerce of Java, whose produce, that of some at least, brings large sums annually to the treasury, are not indigenous to that beautiful country, but have been brought to it from elsewhere,—Coffeees from Arabia, indigo from Southern Africa, cinnamon from Ceylon, vanilla and nopal from Mexico, tobacco from America, rice from China and Japan, etc. Of some others the origin is no longer to be known. Other plants were originally there, but specimens of them have also been imported from other places, and they all succeed excellently. To expose all this in detail would be to communicate things already known.†

The Island of Java must be considered as having not high alone, but also low temperature, and different climates, even if it be not known by experience. On one and the same island grow cocoa-palms and species of oak; from its plains to the different elevations are found all the varieties of vegetation which are met with, from the equator to the temperate zones. The plains of Java furnish the tropical flora in

* Von Humboldt (and we cannot produce a greater authority) says in his *Essay 'Sur la Géographie des Plantes,'* p. 27: "L'homme, inquiet et laborieux, en parcourant les diverses parties du monde, a forcé un certain nombre de végétaux d'habiter tous les climats et toutes les hauteurs; mais cet empire exercé sur ces êtres organisés n'a point dénaturé leur nature primitive. La pomme-de-terre, cultivée à Chili à trois mille six cents mètres de hauteur, porte la même fleur que celle que l'on a introduite dans les plaines de la Sibérie. L'orge qui nourrissait les chevaux d'Achille était sans doute la même que nous semons aujourd'hui. Les formes caractéristiques des végétaux et des animaux, que présente la surface actuelle du globe, ne paraissent avoir subi aucun changement depuis les époques les plus reculées," etc.

† Humboldt says (p. 27), "C'est ainsi que l'homme change à son gré la surface du globe et rassemble autour de lui les plantes des climats les plus éloignés. Dans les colonies Européennes des deux Indes un petit terrain cultivé présente le café de l'Arabie, la canne à sucre de la Chine, l'indigo de l'Afrique et une foule d'autres végétaux qui appartiennent aux deux hémisphères." Others think indigo an Indian plant, although from the different information and opinions we may deduce that the matter is uncertain.—See Roxb. *Fl. Ind.* iii. 379; Wight and Arn. *Prodr.* p. 202; Royle, *Ill. Himal.* t. 195; Alph. de Candolle, *Geogr. Bot.* ii. 854.

all its varieties; and the heights, table-lands, and mountain-tops, the floras of Southern and Middle Europe. The plains of Europe present many floras agreeing with that of the Java mountain-tops, which are 9000 feet higher.

The progress of our knowledge of the geographical propagation of plants, and of that propagation in connection with the knowledge of the physical constitution of countries, offer a vast field for enterprise in the culture and transplantation of plants, which may sometimes be brought from distances of thousands of miles.

The situation of many of the Quinquina districts being analogous to the geographical breadth of Java, must not be lost sight of. If this island does not present a like temperature in respect to the division of the quantity of sunlight, that mighty spur to vegetation, it will however give some analogy.

There exists at Java a principal requisite, which is of the greatest importance, and which almost warrants success. It is this: a good result to the transplantation of the Quinquina-tree from its native soil to a foreign land, can only be expected if (except conditions of less weight) one principal condition be fulfilled, namely that the trees be not planted in any country beyond the tropics; as only in the tropics does a temperature sufficiently even and unvarying last during the whole year, and by which the free development of the Quinquina-tree is made dependent by nature, as it appears in the geographical extent of those trees in Bolivia, Peru, Ecuador, New Granada. For this reason, the countries without the tropics, as Algiers or the Himalaya Mountains, could never serve for the culture of the Quinquina-tree, because they lie without the tropics, and the difference in the temperature of winter and summer is too great to suppose that trees that have been used to an even temperature through the whole year, would thrive there. Similar elevations, with a climate constituted as nearly as possible alike, having the same variations by day and night, are to be found. On the mountains of Java, floras similar to those of the Quinquina-woods of Peru, may indicate the way, the place, the soil probably, where the Quinquina may be cultivated with good success.

In the opinion of Dr. Junghuhn, the elevation for the culture of the Quinquina is to be found at 5000 and 6000 feet, or even higher, particularly as we can with confidence assert that, in America, experience has taught us that those sorts which are met with in the lower stations

produce less Quinine, and are used by the Cascarilleros only to mix with the better barks.

The experience at first acquired should plead for the correctness of the assertion of many Dutch naturalists, who have frequently raised their voices in this important cause, and for the merited confidence which was reposed in their opinions by the present Minister for the Colonies, M. Charles Pahud, under whose direction, doubtless to his own satisfaction, this matter was begun and has been so far successfully carried out; indeed the culture is already begun, as we think we have established in this communication; but particularly by advices from Java, by which we are informed that the culture of the Quinquina is so far advanced that they are of opinion that it is *impossible for it to fail*. These foreign plants have been so acclimated, multiplied, raised from seeds, planted out, and all with such good success, that the Quinquina plantation is reported as being in a very flourishing state.

We are convinced that unless great and not to be foreseen calamities befall them, we shall in a few years see Quinquina plantations at Java yielding the best sorts of Peru and Bolivia. The number of trees which may be raised in a few years is incalculable; but if we take for the basis of our calculation, the fact that a small tree, which arrived at Java three years ago, is now five feet and a half high, and has given off sixty striplings, then, in a few years, by a proportionate continuation of the culture, the number of trees will be increased to millions.

Thus we have succeeded in carrying out a matter in which the whole human race has an incalculable interest, and which was undertaken, not for the Netherlands alone, from thirst for gain or commercial speculations, but for the real benefit of mankind. We flatter ourselves that the Netherlands, on this account, may reckon on the approbation of the whole civilized world.

BOTANICAL INFORMATION.

CUBA BAST in JAMAICA.

Cuba Bast has been long known as a peculiar fibrous substance, exhibiting a most delicate yet lace-like character, used for tying up bundles of Havannah cigars, and more recently as a substitute for Russian Bast

(the inner bark of the common Lime-tree) for tying up plants ; but as to its origin, or the plant or tree that yields this beautiful commercial substance, we have hitherto been much in the dark, as we were a few years ago with regard to the so-called "Rice-paper" of the Chinese. We have corresponded with merchants in Havannah on the subject ; we have searched in vain in books, especially in the ' Histoire Botanique de l'Ile de Cuba ' of M. Ramon de Sagra, Directeur du Jardin Botanique de l'Ile de Havane, etc. ; and we have made personal application to this gentleman ; but all in vain : we could gain no information whatever, to be depended upon.

At length, a valued and intelligent friend of ours, Henry Christy, Esq., during a short sojourn in Havannah, made the needful inquiries respecting this Bast, and one or two other products of botanical or commercial interest, the result of which we have recorded in our Notes upon the Vegetable Products of the Great Paris Exhibition, which will appear shortly in the published Reports, and from which we make the following extract, under the head of the "Spanish Possessions or Colonies." These we said "to be miserably represented, Porto Rico only exhibiting a few unnamed *indigenous woods*, samples of Gum Elemi, and fibre of Banana, Maguey, and Ananas. Cuba ranks a little higher ; but its productions here exhibited are almost exclusively manufactured articles, and, as might be expected, chiefly Tobaccos and Cigars. We searched in vain for specimens or information relating to the little-known Pine which gives name to the 'Isla de Pinos,' or the celebrated wood called 'Sabieu.' The origin of this wood is still a vexed question ; Don Ramon de Sagra attributing it to the *Acacia formosa* of Humboldt and Kunth ; Mr. Bentham, to a new species of *Lysiloma*, viz. *L. Sabieu*, Benth. 'Son bois,' says M. de Sagra, 'est dur et d'un usage très répandu ; on en fait des soulives ou des planchers ; on l'emploie également dans certains ouvrages de charronage, par exemple dans la construction des charrettes.' This has been a great article of trade with the Cubanites ; and no less so is a very beautiful substance familiar to us under the name of Cuba Bast, and long known as the material used for binding the Havannah cigars into bundles. It is a kind of Lace-bark, and of the same nature, being the inner layers of the bark of a tree, almost as delicate, and even more silky than the well-known Lace-bark of Jamaica (*Lagetta lintearia*). Of late years, it would seem, the merchants of Cuba can turn it to better account ; it has been found by gardeners and

nurserymen equally fitted for tying up plants, etc. as the Lime-tree bark or Bast from Russia, and has been largely substituted for it; and it is imported in bundles, and may be often seen at the shop-windows of nursery and seedsmen in London on sale.

"All these three objects, information respecting which the Spaniards withhold from us, have been recently investigated by a scientific friend of mine, a casual visitor to Cuba, Henry Christy, Esq. Branches with cones of the *Pine* have been communicated by him during the present year (April, 1855), and prove it to be identical with, or very closely allied to, the North American *Pinus resinosa*, Soland., of which Cuba may be considered the southern limit, as Lake St. John, Canada, is the northern. Its leaves are longer than in the continental *P. resinosa*, but in other respects they, as well as the cones, seem to be identical. I possess specimens from New Orleans, so that this species has a most extensive range. Specimens of *Sabicu*, again, sent at the same time, prove that Mr. Bentham's views, expressed in the 'Kew Garden Miscellany,' vol. v. p. 236, are correct (it is *Lysiloma Sabicu*); while specimens and seed-vessels, from which young plants are raised at Kew, show the *Cuba Bast* to be a Malvaceous plant, the *Paritium elatum*, Rich. (*Hibiscus elatus*, Sw.), a tree scarcely to be distinguished from the *P. tiliaceum*, St. Hil."

The fact of the plant yielding Cuba Bast being the *Hibiscus* (or *Paritium*) *elatus*, is further confirmed by seeds sent to, and reared also at, Kew, from a resident in the Island, Mr. Scharfenberg. It is worthy of note that this *Hibiscus elatus* (a very near ally of *H. tiliaceus*, L.) had been, till lately, known as a native of Jamaica only; but it is correctly introduced, with a very good description, into the 'Flora of Cuba' of Don Ramon de Sagra (vol. i. p. 146), without a word being said relative to the properties or uses of it. Thus the *Bast* is known as a product of the Island, and the *Hibiscus elatus*, Sw., is acknowledged to be an inhabitant of the Island; but the connection between the two was unknown.

Recently (September, 1856), among an interesting series of vegetable fibrous substances, collected and prepared by Mr. Wilson,* of the

* We have had occasion, in our Report on the Jamaica Collection of the Great Paris Exposition, 1855, to notice the valuable services of Mr. Wilson, rendered to Jamaica and to the commercial world generally, by his collections of the vegetable fibres, and by the accurate nomenclature of the plants yielding them.

Botanic Garden, Bath, Jamaica, I was agreeably surprised to find one kind so exactly corresponding with the Bast of Cuba, that I had but to place the two side by side to prove that they were identical; and still more was I gratified to find this Bast ticketed as the produce of "*Hibiscus elatus*, Linn."! Mr. Wilson however is not yet aware that he has here detected the *Bast of Cuba*. Such however it is; and, if really of commercial value, of which mercantile men are the judges, Jamaica in its present sunken state, might derive advantage from collecting and exporting this substance. Lunan ('Hortus Jamaicensis,' vol. i. p. 468) speaks of the *Hibiscus elatus*, under the name of *Mahoe* or *Mountain Mahoe*, as a large tree, having been found sometimes sixty feet high and eight in circumference, and frequent in woods. "In some places it is known by the name of *Tulip-tree*. It is accounted a good timber, and the bark makes excellent ropes." Macfadyen (Flora of Jamaica, vol. i. p. 69) further adds, that the timber of this tree is much prized by cabinet-makers, having, when worked up and polished, the appearance of dark-green variegated marble.

An intelligent officer of the Custom House informs me that the price put upon the Cuba Bast, by the mercantile gentlemen who import it, approaches the rate of 2*s.* 6*d.* per lb., and there is a duty of between 10*d.* and 1*s.* per lb.; so that there is no wonder that the imports of this article are diminishing instead of increasing. It would be strange if Jamaica, with an unlimited amount of the tree producing it, cannot afford to supply the English market at a much lower rate; and it is to be presumed the duty would be avoided in coming from one of our own Colonies.

Jersey Cabbages.

Jersey is celebrated for its Cabbages, and for their tall, tree-like character, a peculiarity partly owing to the custom of the peasantry in removing lower leaves—almost daily—to feed their cows. Thus a cabbage-garden in Jersey has somewhat the appearance of a little grove of Palms; so that in walking between them you literally walk under their foliage, which forms a crown at the top; and such stems are not unfrequently ten and twelve, and more, feet long, quite erect, and straight, and are made use of for a great variety of purposes. Planted closely,

as living fences, they keep out fowls and small animals; sheds are thatched with them; they serve as stakes for Kidney-beans, Peas, etc., and the stouter ones as cross-spars for the purpose of upholding the thatch or roof of the smaller classes of farm-buildings, cottages, etc., and, if kept dry, are said to last upwards of half a century. Our friend Mr. Samuel Curtis, a resident in the island, informs us that he has seen a stalk that measured sixteen feet in length, and that one that had grown up under the protection of a cider Apple-tree had its spring shoots at the top occupied by a magpie's nest! The stems are now much used for making walking-sticks ("Jersey Canes"). Stalks eleven feet high, and very good-looking and firm walking-canes, are deposited in the Kew Museum of Economic Botany.

Algerian Plants.

The indefatigable Botanist, M. Bourgeau, writes to us from Paris (Rue St. Claude-au-Marais, n. 14), in a letter dated September 9, as follows:—

"J'ai l'honneur de vous annoncer le retour de mon voyage d'Algérie. Depuis un mois, je suis occupé à faire déterminer ma récolte, et j'ai déjà commencé l'impression des étiquettes. Je crois pouvoir en faire la distribution vers la fin du mois de Novembre prochain. La collection de cette année n'est pas très-nombreuse. Elle sera de 350 espèces environ. Monsieur Kralik, qui a accompagné M. Cosson, a récolté environ cent espèces des plus rares et des plus nouvelles, et elles feront partie de ma collection.

"J'ai, comme d'habitude, un assez grand nombre de plantes intéressantes. Le prochain numéro du Bulletin de la Société Botanique de France vous donnera des renseignemens sur le voyage que je viens de faire.

"J'ai quelques échantillons de bois pour votre Musée et des graines de quelques plantes rares."

Schimper's Plantæ Abyssinicae, e territorio Agow.

We have had the satisfaction to receive our set of Mr. Schimper's

late collection of Abyssinian plants from the territory of Agow, and we may confidently say that they are well worthy the attention of botanists. The species are many of them new; all are good specimens, and in excellent preservation: they are named, and the special localities given, and they are very reasonable as to price. Our set reckons 210 species, at the price of £2. 17s. 7d.

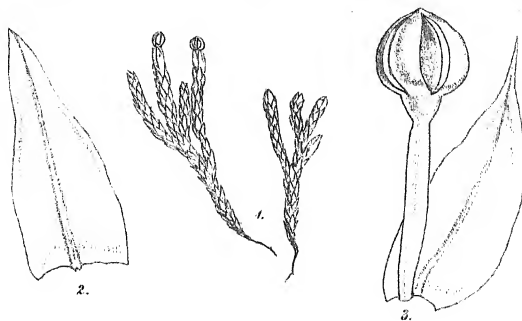
They are on sale, together with many other collections from various parts of the world, at Mr. R. F. Hochstetter's, Esslingen, near Stuttgart. Some of those more recent collections are enumerated, with their prices, at p. 284 of our present volume.

NOTICES OF BOOKS.

HOOKE, SIR W. J.; *Kew Gardens, or a Popular Guide to the Royal Botanic Gardens of Kew*. Thirteenth Edition. London, 1855. Longman and Co.

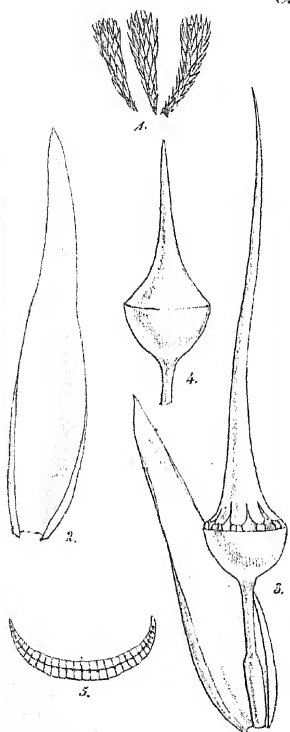
HOOKE, SIR W. J.; *MUSEUM OF ECONOMIC BOTANY, or a Popular Guide to the useful and remarkable Vegetable Products of the Museum of the Royal Gardens of Kew*. Second Edition. London, 1855. Longman and Co.

We have no intention of describing the contents of the two little works here noticed: the object of the Author in preparing them is (to use a familiar expression of the present day) to *popularize* Botany,—in the first in what concerns the living plants of the noble Gardens of Kew, and in the second in what concerns the *products* of the vegetable kingdom, as displayed in the Museum of the same Gardens; with what success some judgment may be formed from the fact, that the *Kew Garden Guide* has, exclusive of spurious and piratical copies, gone through thirteen editions (each of 3000 copies), in the short space of eight years. The *Museum Guide* had the first edition published last year (1855), and the second edition was called for in June of the present year.



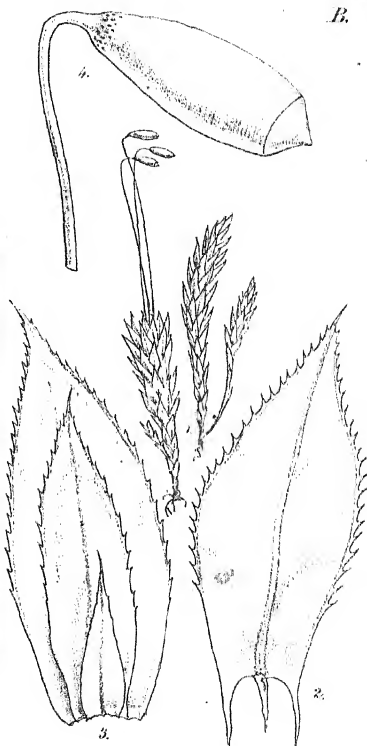
A.

Andraea Australis, Mitten.



C.

Schistostrium Cardenerianum, Mitten.



B.

Mnium verstaun, Mitten.

A List of some MOSSES and HEPATICÆ, collected by the Rev. Charles Parish, at Moulmein, and communicated to Sir W. J. Hooker; by W. MITTEN, ESQ.

(Tab. XII. C.)

MUSCI.

1. *Garekea phascoides*, C. Müller. (Dicranum, Hook.)

HAB. On clay-banks. (No. 6.)

2. *Leucoloma Taylori*. (Syrrophodon, Schw.)

HAB. On trees in jungles. (Nos. 10; 19.)

3. *Leucoloma tenerum*, Mitten, MSS.

HAB. Moulmein. (No. 0.)

Closely allied to *L. molle* (Dicranum, C. Müller), but differing thus:—plants more slender; leaves not papillose on the back, the margin evidently hyaline about the base of the subulate portion of the leaf, the cells of the middle band more minute and obscure, those of the base, “cellulæ alares,” firmer and red-brown. Mr. Parish mentions his having seen the fruit; but it is not present on the specimens sent.

4. *Dicranum* (Campylopus) *subluteum*, Mitten, MSS.

HAB. Nwa-labo (the Ox’s-hump), a mountain near Tavoy.

Habit and general appearance similar to that of *D. (C.) flexuosum*, but more robust, with leaves suddenly narrowed from an oblong base into a long, subulate point, consisting almost entirely of nerve, smooth behind and slightly denticulate at its apex; the base is composed of firm and uniform cells, the nerve occupying one-third of the whole width; the “cellulæ alares” are small, pale-red, and plane.

In all the species yet received from India with firm cell-structure in the lower part of the leaf, the pagina gradually tapers off towards the point, but in this it is abruptly contracted.

5. *Didymodon flaccidus*. (Weissia, Harvey.)

HAB. On the ground in damp places. (No. 4.)

This curious little species is closely allied to *D. sphacnifolius*, Hooker, with which it is certainly congeneric. The mouth of the capsule is remarkably thickened and contracted, so that the short red teeth are nearly horizontal in their direction, a little irregular at their sides, and the medial line scarcely evident. The leaf structure corresponds with that of *D. flexifolius*, but is thinner and more flaccid.

6. *Macromitrium sulcatum*, Brid.

HAB. Moolee, alt. 7000 feet. (No. 24.)

7. *Macromitrium calymperoides*, sp. nov.; dioicum?, repens, ramis brevibus densifoliosis, foliis madore patentibus siccitate contortis breviter lanceolatis obtusiusculis nervo rufescente carinatis e cellulis subquadratis superne opacioribus sed distinctis papillois areolatis apice papilloso-crenulatis, perichætialibus imbricatis brevi-lanceolatis acuminatis margine serrulatis, theca in pedunculo subunciali tortili cylindrica lævi, operculo subulato, peristomio e dentibus 16 geminatis pallidis siccitate reflexis, calyptra dense appresso-pilosa capsulam totam longissime superante.

HAB. On a tree near Tavoy. (No. 90.)

Similar to *M. Nepalense*, Schw., in size and habit, but differing in its not spirally-twisted foliage when dry, the uniform sub-hexagonal and larger cell-structure of its leaves, which is distinct in the upper portion, not obscure and opaque, and more evidently papillose. The calyptra in both species closely invests the capsule, and has some resemblance to that of the species of *Calymperes*.

8. *Bryum coronatum*, Schw.

HAB. On old pagodas. (No. 8.)

9. *Mnium* (*Rhizogonium*) *spiniforme*, L.

HAB. Nwa-labo. (No. 91.)

10. *Fissidens polypodioides*, Hedw.

HAB. Nwa-labo. (No. 00.)

11. *Meteorium squamosum*. (*Neckera*, Hook.)

HAB. Pendulous from branches of trees in damp jungles, sometimes a foot or more long. (No. 21.)

12. *Distichia exserta*. (*Neckera*, Hook.)

HAB. Damp jungles (?).

13. *Omalia flabellata*, Brid.

HAB. Jungles in the mountains (†).

14. *Leptohymenium julaceum*. (*Pterogonium*, Hook.)

HAB. Fruiting in the rains, August and September. (No. 7.)

15. *Hypnum Tavoyense*, Hook.

HAB. Common on trees. (No. 5.)

16. *Hypnum rostratum*. (*Neckera*, Griffith.)

HAB. In tufts around the joints of bamboos, near the top of Nwa-labo, at an elevation of about 4000 feet. (No. 91.)

This Moss is allied to *Leskia caespitosa*, Sw.

17. *Hypnum lignicola*, sp. nov.; monoicum, pusillum, laxe caespitosum ramis simplicibus decumbentibus, foliis patentibus ovatis longe tenuiter subulato-acuminatis enerviis integerrimis cellulis teneris angustis albidis alaribus vix distinctis, perichæatialibus subulato-lanceolatis patulis, theca ovali æquali flexura pedunculi gracillimi horizontali, peristomio magno interno ciliis solidis.

HAB. On trees (rotten wood), Moulmein. (No. 12.)

Nearly allied to *H. albescens*, Schw., and to *H. tenerum*, Sw., but with narrower and longer leaves, which are not bifariously appressed. The capsule, contracted below the mouth, is quite equal, and becomes horizontal from the curvature of the slender seta.

18. *Hypnum compressifolium*, sp. nov.; dioicum, ramis elongatis eleganter plumoso-pinnatis planis, foliis patentibus falcatis distiche compressis ovatis acuminatis margine serrulatis nervis binis brevibus, cellulis alaribus obsoletis.

HAB. Moulmein. (No. 26.)

Very closely resembling *H. plumæforme*, Wils., and with it allied to *H. Buitenzorgii*, Mont., but its leaves are much wider, with no trace of the sinuation just above the base. This Moss is common in the Khasia mountains, and seems to be always of a fresh green colour, without a tendency to the golden tint observable in its allies. The branches are three inches long and more, and very much compressed.

19. *Hypnum cymbifolium*, Dzy. et Molk.

HAB. Moulmein. (No. 27.)

20. *Hypnum investe*, sp. nov.; monoicum, caule exili repente nudo, ramis pinnatis, foliis caulinis ovatis, nervo indistincto, rameis ovatis acutis incurvis ramulisque oblongis obtusis marginibus crenulatis papillosis obscuris, nervo pellucido sub apicem evanido, perichæatialibus e basi latiuscula subulatis enerviis parce denticulatis, theca minuta horizontali, deoperculata obovata rugulosa subcarnosa, peristomio normali?

HAB. On rocks, Moulmein. (No. 15.)

Very minute, almost byssoid, much smaller than *H. minutulum*, with the leaves of its ramuli and perichætium of a different form. The stems are destitute of paraphylla.

21. *Leucobryum falcatum*, C. Mueller.

HAB. Nwa-labo, at an elevation of 4000 feet.

22. *Schistomitrium Gardnerianum*, Mitten; conferte cæspitosum, caule erecto fastigiatis ramoso, foliis dense imbricatis erecto-patentibus lanceolatis apice obtusiusculis apiculatis, marginibus inflexis, concavis, e basi ad medium tenui hyalino marginatis, perichætalibus paulo latioribus, theca in pedunculo brevissimo minuta foliis perichætalibus immersa hemisphærica cyathiformi gymnostoma, operculo e basi conica longe subulato rostrato, calyptra longissime subulata basi lacera laciniis fimbriatis. (Tab. XII. C.)

HAB. On trees, Moulmein. (No. 2.)

Resembling *S. speciosum*, Dzy. et Molk., in size and in the form and structure of its leaves, so closely that the barren plant is scarcely distinguishable. The immersed, cup-shaped, gymnostomate capsule is a new feature amongst the Leucobryaceous Mosses. Mr. Parish states that it grows in tufts like *Grimmia pulvinata*.

This curious Moss was first gathered in Brazil by Gardner, with old fruit, in whose collections it was distributed, mixed with *Leskea cæspitosa*, Sw. (*Hypnum crassiusculum*, No. 94); from this source the barren plant was described by C. Mueller as a doubtful *Leucophomes*, from which genus it recedes not only in leaf-structure but in the calyptra. Specimens with perfect fruit have been gathered by Schlim at Minca, at an elevation of 4000 feet, in the province of St. Martha, New Granada, and distributed by Linden as No. 913.

TAB. XII. C. Fig. 1. Plants, nat. size. 2. Leaf. 3. Section of ditto. 4. Capsule. 5. Leaf and capsule, with calyptra; magnified.

HEPATICÆ.

1. *Jungermannia hirtella*, Weber.

HAB. Moulmein. (No. 26.)

2. *Plagiochila Nepalensis*, Ldbg.

HAB. Moulmein. (No. 30.)

3. *Sendtnera juniperina*, Nees.

HAB. Moolee. (No. 31.)

4. *Physotium sphagnoides*, Hook.

HAB. Moolee. (No. 22.)

5. *Ptychanthus striatus*, Nees.

HAB. Damp jungles. (No. 32.)

6. *Lejeunea adplanata*, Nees.

HAB. On an *Erythrina Magui*; also a smaller state on trees. (No. 29.)

Another species has been sent (No. 28), which appears to be closely allied to, or perhaps identical with, *Phoragmicoma tumida*, N. and M.; but the stems are young and creeping, without any trace of fructification.

Description of Two American Species of GNETUM; by GEORGE
BENTHAM, Esq.

(With Two Plates, TAB. II. and III.)

But one species of South American *Gnetum* has been hitherto known: the *Thoa urens* of Aublet, first referred to *Gnetum* by Brown, and quoted under the name of *G. urens* by Blume. Mr. Spruce's researches have added two new species, of one of which complete specimens of both sexes have enabled Mr. Fitch to give the accompanying Plates, the dissections having been kindly supplied by Dr. Hooker.

The structure of the flowers, both male and female, is so exactly that of the Asiatic species of this curious genus, that nothing has to be added to the accurate views first propounded by Brown, or to the detailed descriptions or illustrations of Blume, Griffith, C. A. Meyer, and Wight. Of the two coats which immediately enclose the nucleus in the female flower, or the albumen in the fruit, the inner one, in the American as in the Asiatic species, is extended at the apex, after fecundation, into a style-like protruding process; whilst the outer one remains much shorter, and ultimately is little more than an outer scar at the base of the seed, and these coats are universally admitted to belong to the ovulum and seed. As to the third outermost coating of all, which entirely encloses the ovulum and seed, it is at the time of flowering so nearly similar to the envelope which encloses the stamens in the males, and when the seed is ripe so analogous in position and structure to a pericarp, that it is impossible not to concur with Brown and C. A. Meyer in considering it as either of involucrel or perigonial origin,—contrary to the opinion emitted by Blume, that it represents the ovary, or the still less comprehensible theory of Griffith, that it is the real outer membrane of the ovule or testa of the seed.

The following are the characters of Mr. Spruce's two species:—

1. *Gnetum paniculatum*, Spruce, MS.; dioicum, foliis ovatis rarius ellip-

ticis, paniculis axillaribus amplis aphyllis, amentis fasciculatis brevibus, verticillis approximatis.

Caulis alte scandens, vix digito crassior, nodis intumescens. *Folia* breviter petiolata, 4-6-pollicaria, longius breviusve acuminata, basi rotundata coriacea, venis paucis prominulis. *Panicula* axillares, oppositæ, nunc fere pedales, oppositæ ramosissimæ, nunc minores, oligostachyæ. *Amenta* subverticillata, breviter pedicellata, semipollicaria v. vix longiora, constant e florum verticillis 5-8 (vulgo 6), nunc arcte approximatis, nunc inter se semilineam distantibus. *Involucra* sub floribus breviter cupulata, floribus breviora, integerrima v. obsolete biloba (e squamis 2 connatis composita). *Flores masculi* in verticillo numerosi, filamentis articulatis dense confertis immixti. *Stamen* intra squamam clavatam apice truncatam primo inclusum, dein protrusum, apice antheram terminalem bilocularem ferens, loculis rima transversali dehiscentibus. *Amenta feminea* masculis similia nisi minora et pauciora. *Ovulum* per anthesin intra squamam subglobosam arcte inclusum, acumine styliformi integro post anthesin breviter protruso, demum evanido. "*Drupa* magnitudine et forma ovi columbæ, viridis, purpureo tincta. *Pericarpium* carnosum; endocarpium cartilagineum subfibrosum, a pericarpio facile separandum. *Semen* pericarpio conforme, basi lata affixum, cæterum a pericarpio liberum, testa papyracea. *Albumen* carnosum. *Embryo* intra cavitatem albuminis reversus; radícula longa, filiformis, spiraliter torta et corrugata; cotyledones minutæ" (R. Spruce, *in schedis*).

This appears to be common in the Gapó and Capoeiras of the Upper Rio Negro and its affluents. In the first distribution I had mistaken the female specimens for a distinct species, to which I had given the name of *G. microstachyum*; but a series of specimens since received from other localities show me that the characters I had relied upon in the form of the leaf are liable to great variation. Mr. Spruce gathered the species on the Rio Negro, above Barcellos, in December, 1851; near San Gabriel do Cachoeiras in May, 1852; on the Rio Uaupés in September, 1852; near San Carlos, in September, 1853; and on the Rio Guainia, in June, 1854. It has been distributed under the numbers 1923, 2314, and 2554.

2. *G. venosum*, Spruce, MSS.; dioicum, foliis oblongis ellipticisve, paniculis axillaribus aphyllis, amentis tenuibus elongatis, verticillis longe remotis.

Folia angustiora quam in *G. paniculata*, venis evidentioribus. *Paniculæ* in specimine meo (masculo) parce ramosæ. *Amenta* longiuscule pedicellata, bipollicaria vel paullo longiora. *Verticilli* in amento 6-8, inter se 3-4 lineas v. demum semipollicem distantes, paullo majores quam in *G. paniculata*. *Flores* numerosi, iis ejusdem speciei similimi.

In the Gapó at Managuiry, at the confluence of the Rio Negro and the Solimões, June, 1851 (Spruce, n. 1579).

A specimen from the last expedition into Guiana of the two Schomburgks (Sir Robert Schomburgk, n. 1013, Richard Schomburgk, n. 1737), probably from the neighbourhood of Roraima, is nearly allied to the last, and perhaps a mere variety: the male verticils are larger, and still more remote, and the leaves are more like those of *G. paniculatum*; my specimen is however very imperfect.

Aublet's species is unknown to me: from his figure, it is monœcious, and there are leaflike bracts under the ramifications of the panicle, which I have never observed in either of the two preceding species.

Plate II. *Gnetum paniculatum*, mas. 1. Flowering amentum. 2. Portion of a verticil of flower, vertical section. 3. Male flower. 4. The same, with the involucre scale cut open, and two of the filaments which surround it:—*all magnified*.

Plate III. *Gnetum paniculatum*, foemineum. 1. Flowering branch, natural size. 2. Amentum. 3. Female flower, enlarged after fecundation, with the protruding styliform process of the inner coat of the ovule. 4. The same, vertical section, showing the nucleus, the two coats of the ovule, and the involucre scale which encloses it. 5. Fruit. 6. Endocarp. 7. Fruit cut open, showing the seed, the endocarp, and pericarp. These however are represented rather too distinct: they form but one coating when young, and are only separable at maturity. 8. Vertical section of the seed, showing the cavity of the albumen in which the embryo lies; the embryo itself, described from fresh specimens by Spruce, was destroyed by insects in the seeds sent home. 3 (in the upper part of the plate). Articulated filaments which surround the flower:—Nos. 2, 3, and 4 *magnified*, the remainder *natural size*.

On *POLYPODIUM ANOMALUM*, a new Species of Fern, bearing its Sori on the upper side of the Frond; by SIR W. J. HOOKER, K.H., F.R.A. and L.S.

(TAB. XI.)

Polypodium anomalum; fronde ampla ovato-lanceolata subcoriacea polystichoidea, bi-rarius inferne subtripinnata, pinnis primariis lanceolato-acuminatis, pinnulis brevi-petiolutis subfalcatis oblique ovatis ovato-lanceolatisque acutis lobato-pinnatifidis apice grosse serratis lobis acutis (rarius obtusis nunc mucronatis) basi superiore auriculata, soris biserialibus in venulas terminalibus in parte superiore frondis sitis!, stipite rachibusque copiose paleaceo-squamosis.

Polypodium anomalum, Hook. et Arn. MSS.

HAB. Ceylon, Mrs. General Walker, G. H. K. Thwaites, Esq.

DESCR. An entire frond of this plant measures $1\frac{1}{2}$ foot long (exclusive of the stipes, which is 15 inches); in form its outline or circumscription is broad, ovato-lanceolate, acuminate, of a firm, subcoriaceous, but not very thick substance, bi- or rarely below tripinnate, primary *pinnæ* spreading, lanceolate, acuminate, 7-8 inches long, secondary *pinnæ* or *pinnules* shortly petiolulate, obliquely ovate or ovato-lanceolate, subfalcate, cuneate at the base, auricled at the superior base, crenato-lobate, subserrate at the very apex, sometimes on the lower *pinnæ* they are deeply pinnatifid, and even again pinnate, the lobes usually obtuse, the serratures and the auricle mucronate or obtuse. *Venation* free, somewhat sunk on the upper, a little prominent on the inferior side; each lobe has a forked vein; the *veinlets* not reaching the margin, the superior and soriferous one pointing to the sinus of the lobes and terminating a little more distant from the margin. *Sori* in two rows upon the pinnules, always terminal, and on the upper or anterior face (very rarely indeed on the under) subrotund and convex (thence hemispherical), never, even in the youngest state, exhibiting any trace of indusium. *Stipes*, *rachises*, *costæ*, and even the under side of the young fronds clothed with more or less deciduous, chaffy scales, of a rich tawny brown colour; those on the under surface of pinnules are exceedingly minute, distantly scattered and appressed; those on the rachises, especially on the main rachises, are copious, larger, lanceolato-subulate, and spreading; they are most copious and larger on the stipes, and very large and broad, ovate, acuminate towards the lower part of the stipes, but at its very base, when the stipes had been severed from the caudex,

the scales are again contracted, subulate, and closely imbricated. So deciduous are the scales sometimes, that we have a specimen with scarcely a trace of one upon them.

Many years ago this anomalous Fern attracted the attention of Dr. Arnott and myself, in the Hookerian Herbarium, when the only specimens we had received were from Mrs. General Walker. Lately we have been favoured with specimens in a letter from our friend Mr. Thwaites, gathered by him in a mountain region in the same island, accompanied by the remark that "the fructification appeared to be on the *superior*, and not, as usual among Ferns, on the under side of the frond." This upper side is at once recognizable by the darker colour, more glossy surface, slight convexity, and still more surely by the furrowed rachis and more or less sunken veins. The plant is here figured rather with a view of directing attention to the fact, than from a conviction of the specimens being otherwise than a *lusus*: nay, were it not that even in the youngest state of the fructifications we find no trace of indusium, I should be disposed to consider it an abnormal form of *Polystichum vestitum*, where, too, the indusium is often early deciduous. It is true that, if viewed in the light of a monstrosity, the absence of an indusium might be accounted for by the supposition that the upper surface of the frond was destitute of that peculiar organization which would give origin to the indusium. Such is not the fact however with a specimen of *Asplenium* lately placed in Dr. Hooker's hands by N. B. Ward, Esq. (*Aspl. Trichomanes*, L.), gathered in Italy by E. W. Cooke, Esq., R.A., which, besides the copious fructification on the under side of the frond, exhibits one pinna bearing a solitary sorus on the disc of the upper side, with its indusium as perfect as any on the under side. Even on one specimen of *our present* plant I have detected, on two or three of the pinnules only of an entire frond, a few sori on the under side, and in one or two instances corresponding with a young sorus on the upper side.

I am aware that some acrostichoid Ferns (*Polybotrya*, for example) are considered to have both paginae of the pinnules clothed with fructifications, and this is the normal character of the particular species, and where the whole frond, changed in form, becomes fertile; and the *Davallia immersa*, Wall. (*Leucostegia*, Pr.), has been described as bearing the sori on the upper side, but this is in appearance only, for, as Presl well explains it, "Frondis—pagina superiore pallidiore faciem

paginæ inferioris reliquarum Filicacearum præseferente, inferiore intensius viridi nitidiorè faciem superiorem referente."

Mr. Thwaites will, we have no doubt, make further observations on the *living* plant, and will probably be able to show satisfactorily whether this is, or is not, an abnormal form of *Polystichum vestitum* (*Aspidium vestitum*, Sw.), a frequent inhabitant of Ceylon.

TAB. XI. Fig. 1. Lower portion of a frond of *Polypodium anomalum*, exhibiting the *superior* or *anterior* side, with its fructifications, *nat. size*. 2. Pinnule, upper side, with fructifications, *magnified*. 3. Pinnule, showing a few sori, which have occasionally been seen on the under side, *magnified*. 4. Lower portion of the stipes, *nat. size*.

Sketch of the Life and Writings of M. DE MARTIUS, Secretary to the Bavarian Academy of Science; by ALPHONSE DE CANDOLLE.

(Translated from the '*Bibliothèque Universelle de Genève*,' Janvier, 1856.)

Such periodicals as the present are open to just censure, inasmuch as they frequently give an account of trifling pamphlets and small publications of ephemeral interest, to the neglect of those larger works which exert a prolonged influence upon science. And the cause is obvious; for a pamphlet is quickly analyzed, while years, often a lifetime, is devoted to bringing out, in single numbers, and perhaps chiefly in plates, those costly books which finally stand like statues or triumphal arches, but whose progress is gradual and almost unseen.

This is eminently the case with botanical works, when they consist of long series of descriptive matter, analyses, and plates; and especially if they treat of exotic productions, unknown even in our stoves. The numerous and important works of M. de Martius are a case in point. I never received a number of the '*Flora of Brazil*,' or the '*Natural History of Palms*,' but I was tempted to record it in the bulletin of the '*Bibliothèque Universelle*;' and then I desisted, through a reluctance to weary my readers by narrating details concerning unfinished works, whose merits it would be very difficult to convey in words.

The opportunity is now presented; for the illustrious author has just completed his three great works, and he has marked an important epoch

of his life, by renouncing the functions of public instructor, which he had held for thirty-three years, with the view to devoting all his energies to one single publication, and to the Secretaryship of the Academy. It is natural for his friends and pupils, and for all those botanists who have benefited by his labours, to wish to review a career which, though still unfinished, has been meritoriously filled. We owe this homage to one of our guides, whose labours suggest many useful reflections on the present state of European Botany.

Dr. Charles Frederic-Philippe de Martius was born at Erlangen on the 17th of April, 1794. The Latin termination of his name is not an unusual thing in Germany, but is often connected with literary parentage, and with a period when authors wrote everything, even their own names, in the classic tongue: it may be deemed the stamp of intellectual pedigree. Galeottus Martius, a native of Ravenna, was in 1428 the librarian of the famous Hungarian King, Matthias Corvinus, and he was one of the ancestors of our botanist, whose grand-uncle, again, Henry de Martius, published in 1812 a 'Flora of Moscow,' of which the entire first edition, except two copies, was destroyed in the conflagration of Moscow. His father, Ernest William, who died in 1849, at a very advanced age, had been, in conjunction with Hoppe, one of the three founders of the Ratisbon Botanical Society: he wrote a 'Journey in Franconia and Thuringia,' bearing chiefly upon Mineralogy and Natural History; and towards the close of his life he published a volume, entitled 'Souvenirs of a Nonagenarian,' which contains many interesting pictures of social life in Germany during the eighteenth century. Finally, the brother of M. de Martius is Professor of *Materia Medica* in the University of Erlangen.

The young Philippe de Martius enjoyed the advantage of pursuing the study of Natural History and Medicine in his native town, guided by his father and his father's friends. He was the botanical pupil of Schreber, who had studied under Linnæus. To the latter circumstance may be in a measure due the clearness of his descriptions, his correct notions on the nature of genera and species, and his generalizing turn of mind. From an early age there was no branch of knowledge which he did not seek to acquire; Zoology under Goldfuss, Chemistry under Hildebrand, Philology under Harless, Philosophy under Mehmes and Vogel; he studied all with attention, or rather with enthusiasm, for he had as strong a bent for arts and literature as for positive science. The

philosophy of Kant and Schelling, then in vogue in Germany, served to combine these opposite tendencies; and to seek imaginary things in realities, and *vice versâ*, was the most fascinating occupation of the young. The German Universities took their full share of these speculations, in 1812 to 1816; and though disgraced by a Sand, it must be asserted that the majority of the pupils were inspired with an honest and disinterested patriotic zeal, and that arts, science, and literature received a powerful impulse at that period. Like their own majestic Rhine, the Germans pursued their course: the troubled and tumultuous mountain-stream works itself clear, strong, and broad, as it flows along the level plain.

M. de Martius had by no means gone all lengths in these juvenile ebullitions: his zeal for study, the influence of his worthy friends, and other soberizing circumstances availed, and soon he had the exciting prospect of making a distant expedition into the New World. During his Erlangen career, Theodore Nees von Esenbeck; younger brother of the President of the Natural History Society, was his most intimate acquaintance: they worked together, and when separated, they carried on a Latin correspondence. Theodore was a remarkably amiable and well-informed man, a close observer, and one whose works, especially the earlier portion of the '*Genera Plantarum Floræ Germanicæ*,' are deservedly esteemed. He and Martius often spent many weeks at Würzburg, in the house of the elder Von Esenbeck, studying botany, science, and philosophy.

At the death of Schreber, the Bavarian Academy purchased his collections, and sent the aged Professor Schrank to Erlangen, to receive them and bring them away. The latter had noticed young Martius' remarkable intelligence, and held out some hope of his obtaining employment at Munich; a prospect which was eagerly seized, for after passing very strict examinations, he became a pupil of the Academy, and in 1816 he was appointed to a charge in the Botanic Garden.

The first of his publications were a '*Catalogue of the Plants in the Erlangen Garden*,' and a '*Cryptogamic Flora of the Environs*.' As may be supposed, these little works were marked by no novelty; materials for which were in fact wanting. War had closed all communication with foreign countries; and herbaria of exotic plants were few and poor, and had already been worked out by the botanists to whom they belonged. True that the '*Travels of Humboldt*,' and the brilliant dis-

coveries, condensed in Mr. Robert Brown's 'Prodrômus Floræ Novæ-Hollandiæ,' had excited the greatest attention among naturalists; but an intercepting barrier now arose, and America was become like an Atlantis, or like an antediluvian world, only known by scattered fragments. Peace was the grand desideratum; and when it was granted, M. de Martius stepped forward as the second discoverer of the New World's vegetation.

The King of Bavaria, Maximilian the First, often walked as a private amateur in the Munich Botanic Garden, where he observed young De Martius, who performed the functions of Director, determining the plants and superintending the workmen, tasks which Dr. Schrank's great age no longer allowed him to do. The Monarch had seen the marvellous vegetation of the Spanish Colonies, and took great interest in plants; and when, shortly after, the Congress of Vienna arranged the marriage of an Austrian Princess to the Emperor of Brazil, and the Austrian Government contemplated sending a committee of *savans* with the embassy, and Maximilian proposed to appoint two Bavarian naturalists, Spix as zoologist and Martius as botanist, gladly did the latter accede. The arrangements were promptly made. A young monarch's desire to receive his bride forbade all lingering delay: a few weeks settled the affair, and our naturalists, who accepted the proffered employment in February, 1817, had embarked on the 10th of April at Trieste, in the Austrian frigate which bore away the future Empress. It might have been well that books and scientific apparatus were more amply provided, and then the transition from the chilly plains of Bavaria to the glowing mountains of Rio Janeiro, covered with virgin forests, and rich in tropical *Orchideæ*, must have made all the more powerful impression upon youthful and unprepared minds. What a contrast, from humble Mosses and dingy Lichens to glorious and stately Palms! We owe much to the memory of the King, who had found an observer so worthy to comprehend and so competent to describe the beauty and magnificence of Brazilian vegetation.

The plan of the expedition was traced by the Bavarian Academy. It was in accordance with the amount of their knowledge of South America. Hardly a naturalist had visited that vast region since Pison and Marcgraf: its interior was almost untrodden; consequently the idea was to send the travellers over the greatest possible range of country, superficially of course; whereas now a directly opposite plan would

be pursued, and the thorough investigation of one province would be deemed the worthier object. In fact, a voyage of discovery, like that of M. de Humboldt in another part of the American continent, was the errand on which our naturalists were bound.

The new scientific conquest of Brazil was pursued by the members of the Austrian commission as follows:—Auguste de St. Hilaire and Sellow investigated, separately and in different directions, the southern part of the empire; Pohl, the principal botanist, explored the central region; Langsdorff and Riedel, whose collections belong to the Museum of Petersburg, went from Rio Janeiro to Bahia and the Amazon River; while M. de Martius (now the sole survivor of all these travellers), ranged, with Spix his colleague, over a much wider territory than any of the others; for he first visited the provinces of Rio and St. Paul, and then reached Pernambuco and Bahia, passing through the interior of the country, and enduring numberless difficulties, privations, and dangers. He made a fine harvest in the province of Ilheos, and soon quitted Bahia for a still more extensive journey, across the provinces of Piahy and Maranhão to the Amazon River, which he ascended as far as the confines of Peru.

MM. Spix and Martius happily achieved in three years this immense journey of from 4000 to 4300 miles, through a hitherto unexplored territory: they incurred no serious accident, and brought home their valuable collections in safety. The Museum of Natural History in Munich was enriched by our travellers with the following treasures:—Mammifera, 85 species; Birds, 350 species; Amphibia, 130 species; Fishes, 116 species; Articulata, 2700 species; Arachnidea, 80 species; Crustacea, 80 species; Plants, 6500 species.

The total expense of the expedition amounted to £2400 (30,000 florins), by no means a large sum, considering the extent of the country which was visited, and the number, novelty, and value of the collections.

But valuable collections are trifles, compared with the use which is made of them. The King, the Bavarian Academy, and the travellers themselves, were perfectly aware that it is not enough to pile up new and curious objects in a museum, but that it is chiefly important to study, figure, and publish them.

MM. Spix and Martius hastened to draw up an account of their journey, and they undertook simultaneously, the former a large publi-

cation on the Zoology, and the latter a similar one on the Botany of Brazil. Unfortunately the health of M. Spix had suffered severely from the tropical climate and the fatigues of the expedition. He died in a very few years after his return; though not till he had completed five works in folio and in quarto, comprising the most important classes of the Animal Kingdom. From that time the whole burden fell on the shoulders of M. de Martius, who singly executed the second and third volumes of the 'Narrative of the Journey,' and who published (besides the botanical works which I shall shortly mention) the 'Fishes,' with the assistance of M. Agassiz, and the 'Insects' with the help of M. Perty. Such were his activity and his tact, that he inspired his fellow-workers with his own zeal, and while sacrificing his private fortune, he roused the interest of princes and the public, and produced in thirty-five years a series of publications of the highest class of merit. A glance at these works will show that this statement is no exaggeration.

The Narrative ('Reise in Brasilien') consists of three quarto volumes, accompanied by a highly curious atlas in folio. The frontispiece of this atlas, which M. de Martius published with the second volume, is characteristic of the author, and of that brilliant epoch when Munich was first adorned with monuments, and became an Italian city north of the Alps: it is a work of art, showing the universal ("*humanitaire*") and yet fanciful genius of Germany. Those who know Kaulbach's grand composition of the Tower of Babel will understand my description. The Past and the Present of South America are allegorically represented. The Equator, under the image of a Divinity, presides over the scene; with one hand he commands the outpouring of the copious waters which are to form the Rivers Orinoco, Amazon, and La Plata; in the other he holds a gigantic kind of lens, by which he concentrates the rays of light on a Goddess, who typifies young America; she, leaning against the Andes, appears as if amazed at her own strength, and but little disposed to use it; beneath her, gnomes wielding mining-tools work in the earth; and all around her a multitude of plants and animals peculiar to South America, display in their abundance the double energy of heat and moisture. At the foot of the page the history of America is portrayed in a very striking manner: warriors, armed with helmets and cuirasses, pursue on horseback, accompanied by blood-hounds, the miserable natives, who fall before the swords and muskets

of their conquerors; while, in the further recesses of the forests, Indians are seen killing and eating wild animals, among them a tapir, which they have hunted. The peculiar aspect of the Caucasian and American race is carefully marked. From amid these scenes of bloodshed and strife rises, in different guise, the actual state of America, represented by a female, the daughter of Europe, who holds a book open on her lap, and in her hand a caduceus, the emblem of Peace, while shepherds and agriculturists, of European descent, stretch out the hand, to implore her protection and bounty. This picture, composed by the illustrious Cornelius, is engraved by his pupil Stilke.

Similar delineations exist in M. de Martius's works, and give proof of his poetical turn of mind, to which, in composition, the German tongue affords many facilities; for it is peculiarly adapted to the narrative of a journey, and its abrupt transitions convey with much force the alternations of the traveller from security to peril, from the narrow and monotonous valley to the torrent's shore or to the mountain's top. In M. de Martius's style, the topographical and statistical details of the journey are diversified with descriptions, as elegant and far more truthful than those of Châteaubriand. I am not an adequate judge of German composition; but I have seen quotations from his pages, as specimens of elegant prose, and I know that the illustrious Goethe admired many of the passages extremely. The 'Narrative of the Expedition' points out many important facts in botanical geography; but it contains neither descriptions nor figures of plants, these being destined to form other more extensive and difficult works, in which M. de Martius was so happy as to obtain the assistance of highly eminent fellow-workers.

The 'Nova Genera Species Plantarum Brasiliensium' consists of minute descriptions, and of 300 plates, carefully executed in the then novel style of *engraving* on stone. The first volume is by Zuccarini, that accurate botanist, so early lost to science: the other two are by M. de Martius. In the second volume are a great many *Amaranthaceæ*, a Family which M. de Martius particularly affected; in the third many new *Gesneriaceæ* and highly curious *Vochysiaceæ* and beautiful *Melastomaceæ*: the publication of the latter was peculiarly opportune, being at the very time when De Candolle was describing Martius's species of this Family in the third volume of his 'Prodromus.' The 'Nova Genera' includes about 350 new species and 66 new genera; but it is the sin-

gularity of the forms, the perfection of the analyses, and excellence of the descriptive matter, which chiefly distinguish the book. The plan was analogous to that of Humboldt's 'Nova Genera,' edited by Kunth, M. de Martius possessing an advantage over the latter able botanist in being the owner of the very plants which he describes, and in having a large number of good specimens at his command. The analyses, which were executed at Munich, by Minsinger and Prestele, are superior to those of Turpin, in being more highly magnified and the details completer, including the embryo and the pollen-grains. Doubtless Kunth and Turpin were the great analysts of their day, but Turpin began to be excelled by other artists, none of whom however equalled for perfection the two Brothers Bauer.

The volume, which appeared between 1828 and 1834, on the Cryptogamic Plants of Brazil, displayed still more forcibly the talent of the Munich artists. The Ferns, described by M. de Martius, are preceded by an admirable dissertation on the anatomy of the stems of the Tree-Ferns, whose structure was then hardly known, by M. de Mohl, whose eight plates are excellently done; indeed the delineations and descriptions are good throughout the volume.

(To be continued.)

*On PAPHYRUS, BONAPARTEA, and other Plants which can furnish
FIBRE for PAPER-PULP.*

[The Chevalier Claussen has published the following interesting notices relating to these plants.]

The paper-makers are in want of a material to replace rags in the manufacture of paper; and as I have paid attention to the subject, I proceed to communicate the result. First, however, I will explain what is required: viz. a cheap material, with a strong fibre, easily bleached, and procurable in an unlimited quantity. I shall now enumerate a few of the substances which I have examined in my researches for a proper substitute for rags.

Rags, containing about 50 per cent. of vegetable fibre, mixed with wool or silk, are considered useless by the paper-makers, and are yearly burnt, to the amount of several thousand tons, in manufacturing prussiate of potash. By the simple process of boiling these rags in caustic

alkali, animal fibre is dissolved, and the vegetable fibre becomes available for making white paper pulp. *Surat*, or *Jute*, the inner bark of *Corchorus Indicus* (?), affords a paper-pulp of inferior quality, and with difficulty bleached. *Agave*, *Phormium tenax*, and *Banana*, or *Plantain* fibre (Manilla Hemp), are not only costly, but it is almost impossible to bleach them. The *Banana* leaves contain 40 per cent. of fibre. *Flax* would replace rags in the manufacture of paper, were it not for its high price and scarcity, due, partly to the War, and partly to the injudicious way in which it is cultivated. Six tons of *Flax straw* are required to give one ton of Flax fibre; and by the present mode of treatment all the woody part is lost. By my process the bulk of *Flax straw* is lessened by partial clearing before retting, whereby 50 to 60 per cent. of shoves (a most valuable cattle food) are saved, and the cost of the fibre reduced. By the foregoing statement it will be seen that the *Flax plant* yields only 12 to 15 per cent. of paper-pulp. All that I have said of Flax is applicable to *Hemp*, which produces 25 per cent. of paper-pulp. *Nettles* afford 25 per cent. of a very beautiful and easily bleached fibre, *Palm-leaves* 30 to 40 per cent., but not easily bleached, and the *Bromeliaceæ* 25 to 40 per cent. *Bonapartea juncoidea* (an *Agave geminiflora* ?) contains 35 per cent. of the most beautiful vegetable fibre known, which is not only available for paper-pulp, but for all manufactures in which Flax, Cotton, Silk, or Wool are used. It appears that this plant exists in great quantities in Australia (?); and it were highly desirable that our manufacturers should import a large quantity of it. The only preparation it requires is to be cut, dried, and compressed, like hay; the bleaching and finishing may be done here.

Ferns give 15 to 20 per cent. of fibre, hard to bleach, and *Equisetum* the same quantity, easily bleached, but of inferior quality. The inner bark of the *Lime-tree* affords an easily bleached, but not very strong fibre. *Althæa* and many *Malvaceæ* yield 15 to 20 per cent. of paper-pulp. Stalks of *Beans*, *Peas*, *Hops*, *Buckwheat*, *Potatoes*, *Heather*, *Broom*, and many other plants, contain 10 to 20 per cent. of fibre; but the extraction and bleaching present difficulties, which will probably forbid their use. The straws of the *cereals* cannot be converted into white paper-pulp after they have ripened their seeds, the joints or knots of the stalks having then become so hard as to resist all bleaching agents. To produce paper from them, it would be needful to cut them green, before the grain appears,—a *probably* disadvantageous plan.

Many *Grasses* contain 30 to 50 per cent. of fibre, not very strong, but readily bleached. Of our indigenous *Grasses*, *Rye-Grass* gives 35 per cent. of paper-pulp, *Phalaris* 30, *Arrhenatherum* 30, *Dactylis* and *Carex* the same. Several *Reeds* and *Canes* contain 30 to 50 per cent. of fibre, easily bleached. The stalk of the *Sugar-cane* gives 40 per cent. of white paper-pulp. The wood of the *Coniferæ* affords a fibre adapted for making paper-pulp,—an accidental discovery of mine, when manufacturing Flax cotton in my model establishment at Stepney, in 1851. I remarked that the Pine-wood vats, in which I bleached, were rapidly decomposed on the surface into a kind of paper-pulp. I collected some, and sent it to the Great Exhibition; but it failed to excite attention, because the want of paper-stuff was not then felt. The leaves and top branches of the *Scotch Fir* give 25 per cent. of paper-pulp, and the shavings and saw-dust of its wood, 40 per cent. The expense of reducing to pulp and bleaching the pine-wood, will be about thrice as much as that of bleaching rags.

As none of the above substances or plants would fully satisfy, in all points, the wants of the paper-makers, I pursued my researches, and at last remembered the *Papyrus* (the paper-plant of the ancients), which I examined, and ascertained it to contain about 40 per cent. of strong fibre, excellent for paper, and *easily* bleached. The sole point which was not quite satisfactory is the question of abundant supply, the plant being confined to Egypt (?)*: I therefore turned my attention to the plants of this country, and had the satisfaction to find that the *Common Rushes* (*Juncus effusus* and others) contain 40 per cent. of fibre, quite equal, if not superior, to the *Papyrus* fibre, and a perfect substitute for rags in the manufacture of paper, and that one ton of *Rushes* contains more fibre than two tons of Flax straw.

A Letter from Mr. J. E. TEYSMAN, Chief Gardener of the Botanical Garden, Buitenzorg, Java, to Dr. De Vriese, etc. etc., on the Cultivation of RAFFLESIA ARNOLDI, R. Br.

In November, 1854, I received from Bencoolén (Bangkahoele) a plant of *Cissus scariosa*, Bl., on the roots of which several plants, of

* Travellers report it as scarcely known in Egypt at the present day. It is frequent in Sicily (indigenous?) and abounds in Western tropical Africa.

different dimensions, of the *Rafflesia Arnoldi*, were growing as parasites. The stem of the *Cissus* had been cut off too short; and probably, from the removal and long journey, the development of the plant being impeded, it, as well as the parasite plants, died off. Among the *Rafflesiæ* however there was one that did reach maturity, and of which the ripe seeds were plainly distinguishable. I had these grafted on other *Cissus* roots, of two different species, as *Cissus scariosa*, Bl., having a flat, tape-formed stem, and *Cissus serrulata*, Rxb., having a round stem; upon both of which species, and perhaps on some others of this genus, it is to be found in a natural state; at least I have found *Rafflesia Patma*, Bl., on the island Noessa Kambanga, or both species close together. This grafting was effected very simply, by making a small incision in the bark of the thicker roots, and inserting in the opening a few seeds of *Rafflesia Arnoldi*, which were covered with a little earth and a few leaves. For a long time after the operation nothing extraordinary was to be seen on the roots; but the incision, although nearly grown over, is still visible. Lately, when revisiting the locality, I perceived very plainly that in different places near to, as well as far from, the incision, several young *Rafflesiæ* (from the size of a green pea to that of a hen's egg) were developed, so that we can now boast of having brought the *Rafflesia Arnoldi* into cultivation, which, considering the slow growth from the grafting until now, we may reckon will require our patience for the period of a year and a half, or a year at least, for the development of the plant. This experiment advances us a stride nearer to the knowledge of this very interesting Family of plants, and of their very intricate development. It is now proved that this plant may be raised from its seeds, but how that takes place in nature remains a secret. The very delicate and fine seeds must be forced upwards and downwards, between the bark and the white wood, and fixed in appropriate places by means of the sap; this appears plainly from the example before us, as the buds or young plants of the *Rafflesia* appeared both above and below the incision, and were at considerable distances.

It is not probable that the seeds of the dead plant are transferred to the stem of the *Cissus*, in the place where the mother *Rafflesia* had grown, as that spot is then covered with dead crusts of the remains of the dead plant, and thus seems to possess little aptitude for the taking up of seeds. This is not the case. Another source of the propaga-

tion must be sought for, which possibly may be, that the seeds of the *Rafflesia*, after the dissolution of the plant, scattered through the woods and forced into the ground by the rain, are taken up by the fine hair-roots of the *Cissus*. It appears to me more probable that this propagation and grafting is effected by insects, which, on the dissolution of the plant, leaving it on account of its disagreeable smell, use these seeds, and transfer them undigested to the roots or subterranean stem of the *Cissus*, and deposit them in some fissure of the bark. From the situation of most of the *Rafflesia*, we should determine that this was done by some insect living underground, as the greater number of the buds are found on the thinner roots, growing wholly underground, although I have seen some few that have been developed a few feet above the soil and on the stem. If however we take into consideration that the seeds may be shifted to a great distance from the place of grafting, by the tissue of cells, or between the bark and wood, then it may be indifferent where the grafting takes place; and it may be effected by winged insects, such as I have frequently seen come off the stem of the plant while in process of dissolution. Still something else must be borne in mind, viz. that it is known that *Rafflesia* are *dioecious*, that is, masculine and feminine. How does the impregnation happen? This may also be done by insects, if two plants of different sexes are at the same time in a state of development: let this be so.* Such cannot have been the case with the plant received from Bencoolen; though it came to us expanded, it was not open when it was dug out of the woods, since the plant has only a few days to live in a flowering state, and it seems almost impossible that the impregnation can take place before the opening, because the leaves all fit so closely upon each other, that no insect could possibly move between them; and yet the seeds of this most probably unimpregnated plant have all come up well here. Lastly, another consideration arises: let it be admitted that the seeds are well impregnated by some means or other, how is it possible that they ripen in so short a time? for only a few days after blossoming the whole plant decays. If the culture of this plant be extended, which there is no reason to doubt, future observations, under a regular watching of the plants in gardens, may possibly clear up much that is dark and unknown, and of what it is impossible to observe in the wil-

* The question still arises, by what way or means is it possible for the pollen to penetrate the cavities of the ovary?—De V.

dernesses in which these plants present themselves. For this however patience and practice are necessary. The period is not far off when these plants may be cultivated in European gardens with success, if they are once imported and strong plants of *Cissus* are raised on which the grafting is to be made afterwards. These plants must be raised in large square or oblong frames, that the roots which are to serve as bases for the *Rafflesia* may spread strong enough. In the same manner must they be imported.

Report of a Committee appointed to investigate the best method of Making and Recording Observations on the period of LEAFING, FLOWERING, and FRUITING of Plants, held during the Meeting of the German Association of Naturalists, at Vienna, on the 19th of September, 1856.

In consequence of a proposal made in the meeting of the Botanical Section on the 18th of September, the following gentlemen assembled in the hall of the Botanical Section, to discuss their views respecting phænological observations, and to agree upon a uniform plan, by which these might hereafter be simultaneously carried on:—Dr. Ferd. Cohn, of Breslau; Dr. Karl Fritsch, of Vienna; Dr. A. E. Fürnrohr, of Regensburg; E. Hampe, of Blankenburg; F. Hazslinszky, of Eperies; Professor Oswald Heer, of Zürich; L. von Heufler, of Vienna; Herm. Hoffmann, of Giessen; Dr. A. Kerner, of Ofen; Dr. A. Pokoray, of Vienna; Dr. Ph. L. Rabenhorst, of Dresden; Dr. Siegfried Reissek, of Vienna; Dr. Adalbert Schnitzlein, of Erlangen; and Dr. Otto Sendtner, of Munich.

Professor Karl Nägeli, of Zürich, was chosen president of this Meeting; and Professor Hoffmann opened the proceedings by giving his ideas on the phænological observations which have hitherto been made. These presented no uniformity, either in their methods or in their objects; which is the more to be regretted, since the number of observers is daily increasing. The object usually sought is to re-establish some relation between climates and the period of flowering,—an attempt which, in the present state of our knowledge, is premature. A further reason why all such attempts have hitherto led to no results, lies in the want of uniformity amongst the observations, and in too many plants being made the subjects of observation. Professor Hoffmann suggested therefore that a smaller number of plants should be selected, and such

only as are widely-spread and conspicuous; further, that a single species, and always the same individual, should be chosen, and the most favourable station for observations fixed upon.

Professor Heer agreed with the views of the first speaker, and stated that in Switzerland thirty-four places had been fixed on for phænological observations, the recently completed account of which he laid before the meeting. He considered of great importance the records of the times free of frost and snow, and of the depth of earth frozen, which had been taken account of in the work lying before him.

Dr. Cohn considered the most important object of phænological observations to be the fixing of the mean times of development at the places of observation, for which indeed a long series of years would be necessary.

E. Hampe perfectly agreed with his predecessor, and drew attention to the fact, that in making choice of the plants to be experimented on, particular attention should be paid to those whose most important stages of development fall at that time of the year of which the temperature most nearly approaches the mean annual temperature. He proposed therefore, in the first place, to determine the places where phænological observations should be carried on.

Professor Sendtner considered it advisable for the present to confine the observations to those places only which now possess meteorological stations, against which Professor Hoffmann spoke. The latter was of opinion that the present meteorological stations are still in such a condition as will not justify any comparison between climates and the periods of flowering plants.

L. von Heufler requested Dr. Fritsch, who had made such observations the study of his life, to communicate to them his experience on this subject.

After Dr. Fritsch had explained some of his views, he proposed that the whole body of gentlemen who had composed instructions for phænological observations, should agree in the composition of one common paper of instructions, which proposal was also agreed to.

In the first place the catalogues of Messrs. Cohn, Fritsch, and Hoffmann, of the plants which these gentlemen had recommended for observations, were united, and the plants were taken in alphabetical order one after another.

The following species of plants were fixed upon:—*Acer platanoides*,

L., *Æsculus Hippocastanum*, *L.*, *Berberis vulgaris*, *L.*, *Catalpa syringæfolia*, Sims, *Colchicum autumnale*, *L.*, *Convallaria majalis*, *L.*, *Corylus Avellana*, *L.*, *Crocus vernus*, *L.*, *Cytisus Laburnum*, *L.*, *Daphne Mezereum*, *L.*, *Fagus sylvatica*, *L.*, *Cornus mascula*, *L.*, *Fraxinus excelsior*, *L.*, *Fritillaria imperialis*, *L.*, *Hepatica triloba fl. cærul.*, *Hordeum vulgare, hybernun* and *æstivum*, *Leucojum vernum*, *L.*, *Lilium candidum*, *L.*, *Prunus avium*, *L.*, and *P. Padus*, *L.*, *Pyrus Malus*, *L.*, *Ribes Grossularia*, *L.*, *Ribes rubrum*, *L.*, *Robinia Pseudacacia*, *L.*, *Sambucus nigra*, *L.*, *Secale cereale, hybernun* and *æstivum*, *Sorbus Aucuparia*, *L.*, *Syringa vulgaris*, *L.*, *Tilia parvifolia*, Ehrb., *Triticum vulgare, hybernun*, *L.*, *Vitis vinifera*, *L.*

A proposal of Rabenhorst, also to include certain *Cryptogams* in the observations, was considered premature, and therefore negatived.

In the plants under examination the following phases should be observed :—

1. The first appearance of the surface of the leaf.
2. The first fully-expanded blossom, the pollen appearing prominent.
3. The first ripe, normal fruit, without worm-hole, at the beginning of the harvest of each sort of grain.
4. General decoloration of the leaves.

Remarks on the duration of vegetation with reference to the weather, namely, the first and last frosts, and the duration of the snow.

Observations are also to be desired on the general period of ripening of flowers and fruits. In observations continued for many years upon leafing, flowering, and fruiting, the same tree, or the same group of similar plants, the same meadow, etc., must always be taken for observation.

(Signed) KERNER ; REISSEK ; POKORAY.

Note on DICHILANTHE ZEYLANICA ; by G. H. K. THWAITES, Esq.

Owing to my overlooking a mistake made by the native draftsman, this species is represented, in Pl. VIII. *A.* fig. 1, of the present volume, as being furnished with interpetiolar stipules ; such is not the case. The description of the plant (at p. 270), explains the true structure.

G. H. K. T.

Note on the Genus DOONA; by G. H. K. THWAITES, Esq.

To the description of this genus, published in Vol. IV. of this Work, page 7 (1852), may be added the following character of the embryo:—Embryo cotyledonibus foliaceis, valde inæqualibus; harum maxima inter stratum oleoso-albuminosum contorto-convoluta, in germinatione inclusa; altera brevissima, in germinatione sæpissime emergente.

The above shows the genus *Doona*, Thw., to be abundantly distinct from *Hopea*, Roxb., the cotyledons of which, like those of *Vatica*, L., are subequal, very fleshy, and emergent in germination.

Seven species of *Doona* have now been detected in Ceylon.

BOTANICAL INFORMATION.

Valuable American Herbarium for Sale.

This Herbarium has been collected, during many years' residence in the United States, by John Carey, Esq., who was actively engaged there in botanical pursuits, but who is now about to give up his house in London, in consequence of a recent severe bereavement in his family.

The Collection includes the indigenous plants of the North American Continent, from Canada to California, and Northern Mexico, containing many of the recent discoveries in the latter countries; and, with respect to those of the Northern and Middle States, it is almost complete, and no less so, to a very great extent, in respect of the Flora of the Southern and Western States. The specimens are unusually full and fine, comprising the best selections from very numerous collections made in all parts of the Union, and amounting, it is believed, to upwards of 50,000; the whole very neatly and carefully cemented down upon upwards of 12,000 handsome, full-sized, and heavy sheets of white paper, arranged in appropriate genera sheets of stiff coloured paper.*

* Notwithstanding, however, the size of the paper, the collection is capable, without inconvenience, of being, if desired, incorporated with any other *Hortus Siccus*; and we know, from those best competent to judge, that this is one of the most remarkable, most complete and faultless of American Herbaria, that has ever been formed, and the most authentically named.

The Herbarium is contained in two large cabinets of American Black Walnut, with glass doors, and appropriately fitted up for the reception of the sheets. To a student of American Botany this Collection would be very valuable, not only for the geographical range of the species, to which great care has been devoted, but also as being of absolute authority as to the species of Torrey and Gray, and other American authors, with whom the Collector was in habits of the closest intimacy.

To avoid the expense and inconvenience of removal, the Herbarium would be sold at a very moderate price to an applicant before Christmas. For further particulars apply to the Proprietor, Mr. J. Carey, 8, Warnford Court, Throgmorton Street, London.

Odal Oil.

Our valued correspondent, the Rev. E. Johnson, M.A., of Pallum Alleppu (coast of Cochin), South India, has sent, together with many excellent dried plants of that country, a bottle of the *Odal* (or, as often wrongly spelt, *Adul*) Oil, used there externally, with other oils, for rheumatism, together with a bottle of the fruit. The Oil is extracted from the seed, and is the product of *Sarcostigma Kleinii*, of which specimens are also sent in the box. "There was a curious mistake," Mr. Johnson writes, "about this in the Report on the Oils of the Madras Exhibition (copied in a note in our Report on the Paris Exhibition of 1855, p. 25): I was granted 'Honourable Mention' for having identified '*Poorana Oil*' as the product of the *S. Kleinii*, while the *Odal Oil* was said to be *still unknown*. Now I do not know the *Poorana Oil* at all. The only meaning I can attach to the word is *Flower Oil*; while, in fact, I *indentified* the *Odal Oil* as the product of *S. Kleinii*."

Another little error is copied in the Report of the Paris Exhibition (p. 30, note) from the Report on the *Gums* and *Resins* of the Madras Exhibition, viz. that the *Mutty Pul* is a resinous exudation "used for incense." Mr. Johnson has kindly sent us specimens of the bark of the *Mutty Pul* (*Ailantus Malabarica*), with its curious resinous grains, but they are not used as incense in any part of the Cochin country.

Müller's European Herbarium.

Mr. Müller, who is the Conservateur of the herbarium of M. De Candolle, at Geneva, where he has had great opportunities of determining accurately and from the most authentic sources the species of plants (of which he has fully availed himself), and being desirous of devoting more of his time to the study of Cryptogamic Plants, has decided on disposing of his own private herbarium of Phanerogamic Plants. The following notice will give some idea of this extensive and well-preserved collection:—

“L’herbier de Phanérogames du Soussigné, offert aux amateurs, se compose de près de 5000 espèces spontanées de la Suisse, de l’Allemagne, de la Hongrie, du Piémont, de la Corse, du midi et de l’ouest de la France et des Pyrénées. En terme moyen chaque espèce est représentée par 2 exemplaires (de deux localités), et chaque exemplaire se compose de 1, 2, 3, pieds ou rameaux d’une plante. La flore du Synopsis de Koch y est à peu près complète; le peu qui manque est surtout de l’Istrie, ou ce sont des formes hybrides. Dans les Ranuncul. Crucif. Legumin. Umbellif. Composit. etc. on a mis beaucoup de soins pour avoir les fruits. Le tout est très bien conservé et les exemplaires sont généralement très beaux. Le prix en est de 100 liv. sterl. (Lettres affranchies.)

“T. MÜLLER, Conservateur de l’herb. DC.,
Cour St. Pierre, à Genève.”

Mr. Spruce's Collections.

More collections of plants have lately been received from this enterprising botanist, from the vicinity of Tarapoto, in Peru. These, together with what will immediately follow, are perhaps the last of a truly tropical character that are to be expected by the subscribers; for Mr. Spruce informs us that he intends to proceed directly to the mountains, on his way to Quito, the capital of Ecuador, whose position, by the side of the great mountain Pichinca (itself at an elevation of 9000 feet above the level of the sea), renders it perhaps one of the finest localities in the world for the Cryptogamist, and as the researches of Dr. Jameson would lead us to expect.

M. HUET DU PAVILLON'S *Plants of Sicily, etc.*

M. Huet du Pavillon has informed us of his and his brother's return from their excursions during the year 1856, in Sicily, Calabria, and the Abruzzos, bringing collections with which they are well satisfied. These will be distributed among the subscribers as soon as they are properly arranged and named.

They also wish the public to be informed that they have still at their disposal collections of from 300 to 400 species from their Sicilian journeys, undertaken in 1855. The price of these and of the present year's collections, are 25 francs the century to non-subscribers.

The address of M. Huet du Pavillon is "Rue Verdaine, n. 266, Geneva."

To the Editor of the 'Journal of Botany.'

Conceiving that in Natural History, as in many other things, it is never too late to retract an error, however long it may have been persisted in, I think it only fair towards Mr. Neisler, that I should beg leave to recall in your Journal the remarks on the subject of *Arachis* and *Stylosanthes* which I made in your 7th vol., pages 177 to 179. Notwithstanding the care with which I had previously examined the flowers of these plants, I now find that, in *Stylosanthes* at least, I was misled by the remarkable changes which take place in the base of the style immediately after fecundation; and although there are some points which I cannot yet clearly comprehend, I readily admit that my former views were erroneous.

GEORGE BENTHAM.

NOTICES OF BOOKS.

HOOKE, DR. JOSEPH DALTON: *FLORA of TASMANIA; being the Third Series of the Botany of the Antarctic Voyage.* Parts I.-III. 4to. London, 1856.

We call attention to this valuable work, not for the purpose of offering any extended remarks or criticisms upon it, but mainly to announce

its being in course of publication (and not tardily, for three stout fasciculi, each of eighty pages, and twenty beautiful plates from the pencil of Mr. Fitch, have appeared), and to express our satisfaction that at length our country is beginning to feel the importance of making known to the world the vegetable productions of her colonies. "Floras" of the kingdoms and empires of civilized Europe (Spain alone excepted) are common enough; and there is scarcely a country in the globe of which *detached* portions have not been explored, and their vegetable riches more or less accurately described and illustrated; but, till within these few years, there has not existed, as far as we know, any such Flora of an extra-European colony, whether under the British or foreign sway, as could be practically useful to a resident or casual visitor who might wish to study Botany. It was the researches and collections of the lamented Sir John Franklin, of Sir John Richardson and Drummond, and the several Arctic voyagers and travellers, which formed the groundwork of the 'Flora Boreali-Americana, or the Botany of the British Possessions in North America,' which appeared in 1840, "under the auspices of the Lords Commissioners of the Admiralty." They procured the means for forming the needful collections, and provided the necessary funds for carrying out the publication,—two volumes, 4to, with 248 plates and an excellent map.

Again, in 1839, the Admiralty sent out an expedition, under Captain Sir James Ross, to explore the Antarctic and adjacent regions; and thence originated, under the same authority, the important botanical series termed 'The Botany of the Antarctic Voyage,' of which the work now under consideration is the third and last section. In 1844–1847 appeared the first portion or series,—two 4to volumes, with 198 coloured plates, divided into two sections: the first comprising the vegetation of certain islands, British Possessions, though they can scarcely said to be colonized, viz. Lord Auckland's Group and Campbell's Island; and, secondly, of Antarctic Regions (*exclusive* of Lord Auckland's Group and Campbell's Island), and embracing our most southern colony, viz. the Falkland Islands. The second section was confined to a rising and now highly important colony, 'The Flora of New Zealand,' which was published in 1853–1855, with 130 plates. This is now followed by the third and last series, describing the vegetation of an equally valuable colony in the southern hemisphere, and which heads this article, viz. 'The Flora of Tasmania,' or, as it has hitherto

been usually called, Van Diemen's Land. This will extend to two volumes, and will be illustrated with 180 plates.

Such are briefly the important services which science owes to the Lords Commissioners of the Admiralty. But they are far from all. Rarely is a surveying voyage sent out, but it is, and has been ever since the days of Cook, accompanied by one or more practical men of science, whose discoveries have been turned to good account. Nor have our Chief Secretaries for the Colonies been backward in encouraging, where it seemed really needful, the formation of Botanic Gardens; and their powerful influence, and that of the Governors themselves, has been felt in many ways in connection with the Kew Gardens and Museum, and is exemplified at this moment in the researches of Dr. Mueller in North Australia, as noticed in the pages of the present number of our Journal. Equally deserving of praise and acknowledgment are the services of the Head and various Chief Officers of the Foreign Office; they embrace every opportunity to promote science in foreign countries: witness the several exploratory journeys into Africa, the results of which are more and more important every day. In that Office our valued friend, George Lenox-Conyngham, Esq., is preparing a series of printed *Instructions* for the study and collecting of objects of Natural History, to be largely distributed among our Ministers and Consuls and the several political agents abroad, the results of which cannot fail to prove valuable.

We turn now to another powerful governing power, namely the Honourable Court of Directors of the East India Company, whose encouragement in former years to the cause of science, and of botany in particular, called forth our hearty commendations in a memoir on the subject, published in the 'Botanical Miscellany,' vol. ii. p. 90, as follows:—"For a long series of years the East India Company have, with a liberality which does them the highest honour, manifested a disposition to foster this branch of science (botany); well aware how much we owe to the vegetable creation for our food, our clothing, our ships, our buildings, and innumerable articles connected with the arts, domestic economy, and medicine; so that commerce might in consequence be materially benefited by an increased knowledge of the vegetable productions of India." Some notice then followed of the noble Botanic Garden of Calcutta (no less than five miles in circumference); of the vast collections of plants made at the Company's expense; of the

many publications of Roxburgh, Hamilton, Wallich, Wight, etc., patronized and fostered by them (especially the 'Flora Indica' of Dr. Roxburgh). All this encouragement was bestowed at a time (1832) when a great portion of their possessions was unexplored; while at the present day, a work which we will take leave to say, though of little pretensions, yet of the highest character and usefulness, is nipped in the bud, for want of that aid which is so entirely in the power, and so eminently to the interest, of the Company to give; we allude to the 'Flora Indica' of Drs. Hooker and Thomson, of which the first volume, octavo, of 565 pages (including the Introductory Essay, in English), accompanied by a most valuable and accurate map, prepared purposely to illustrate the physical geography of India and the botanical provinces, appeared last year, 1855. The work has been twelve months before the public, and has elicited encomia from the first botanists in Europe and in the United States; but the pecuniary loss to the Authors has been infinitely too heavy to justify their continuing the publication without that support which has, unsolicited, been so liberally given by our Government to the Colonial Floras already mentioned. It may not be uninteresting to our readers to be made aware of some of the circumstances that have attended this publication, and we propose to state them at a future period.

GRAY, DR. ASA: *MANUAL OF THE BOTANY OF THE UNITED STATES* (Second Edition), *including Virginia, Kentucky, and all parts of the Mississippi; arranged according to the Natural System.* (*The Mosses and LIVERWORTS* by WM. S. SULLIVANT.) *With Fourteen Plates, illustrating the GENERA of CRYPTOGRAMIA.* 8vo. New York: 1856.

This valuable contribution to the Botany of the United States is, the indefatigable and learned author assures us, designed as a compendious Flora of the northern portion of the United States, for the use of students and practical botanists. "The first edition,"* he continues, "was hastily prepared, to supply a pressing want. Its plan having been generally approved, has not been altered, although the work has been to a

* 'Manual of the Botany of the Northern United States, from New England to Wisconsin and south to Ohio and Pennsylvania inclusive (The Mosses and Liverworts by W. S. Sullivant);' etc. etc.

great extent rewritten. Its increased size (740 pages) is mainly owing to the larger geographical area embraced in it, being here extended southward so as to include Virginia and Kentucky, and westward to the Mississippi River."

This important volume exhibits two principal features: firstly, the increased number of species both of Phænogams and Cryptogams consequent upon additional geographical area included; and secondly, the very beautiful and numerous figures, executed, it would appear, by Mr. Sprague, of the genera of Ferns, Mosses, and Hepaticæ,—thus simplifying to a great extent the study of what must ever be reckoned among the most beautiful of Nature's vegetable forms. These Plates are nearly as valuable to the student of European as of American Cryptogamia, the genera of the two countries being very similar.

The Preface contains some brief interesting notices on the geographical distribution of plants within the given area; and the time, Dr. Asa Gray tells us, is not far distant "when, as the result, especially of the labours and investigations of Prof. Tuckerman upon our *Lichenes*, of the Rev. Dr. Curtis upon our *Fungi*, and of Prof. Harvey upon our *Algae*, as well as of Messrs. Sullivant and Lesquireux upon our *Mosses*, all our Cryptogamia may be in a similar manner presented to the student in the form of a supplementary volume, separate from that comprising the phænogamous or flowering plants."

It is requested that the following corrections may be made in this Volume:—

Page 230, 7 lines from the bottom, *dele* (Plate XI. A. B.)

Page 231, line 19, and at line 25, *for* Tab. XI. A. *read* XII. B.

Page 231, line 7 from bottom, *dele* (Tab. XI. B.).

Page 232, line 1, *dele* Plate XI. B. and all that follows in that and the following line.

Page 257, at the end of line 7 *add* (TAB. XII. A.).

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